COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

FORT LEAVENWORTH, KANSAS

PROPERTY
OF
AIR CORPS LIBRARY
WASHINGTON, D. C.

June, 1941, Quarterly Review of Military Literature
VOL. XXI, No. 81

Volume XXI
1941

Number 81

COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

QUARTERLY REVIEW OF MILITARY LITERATURE

COLONEL F. M. BARROWS, *Field Artillery, Editor*
CAPTAIN O. C. MICHELMANN, *Military Intelligence, Assistant Editor*
LIEUTENANT J. J. GLEASON, *Infantry, Assistant Editor*

June, 1941

Second Quarter

THE COMMAND AND GENERAL STAFF SCHOOL MILITARY REVIEW—Published quarterly by the Command and General Staff School at Fort Leavenworth, Kansas. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rate: One year in the United States and possessions, Cuba and Mexico, $1.00; foreign, $2.00 a year.

Mission

The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a section of "Foreign Military Digests."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This *Review* is published as a guide to modern military tendencies and to inspire vigorous thoughts on the subjects treated.

The opinions expressed and conclusions drawn in articles are *solely those of the authors and are in no sense official.*

●

Acknowledgement

The editors desire to express their thanks and appreciation to those persons who have valuably assisted in the preparation of material for this issue. The work of contributors has been done in addition to their regular duties and on their own time. We are very grateful to the following officers for their generous donations:

COLONEL KINZIE B. EDMUNDS: The article entitled "Lessons from World War II" and book reviews.

LIEUTENANT COLONEL GUY B. DENIT: The condensation of the article "A Portable Disinfestor."

LIEUTENANT COLONEL VICTOR W. B. WALES: The condensation and rearrangement of a map exercise on "The Armored Division in Exploitation and Pursuit," adapting it for publication.

LIEUTENANT COLONEL LEO DONOVAN: For his work in collaboration on the article entitled "Division in Heaven."

LIEUTENANT COLONEL JAMES C. CROCKETT: The article entitled "Some Fundamentals of German Military Operations."

LIEUTENANT COLONEL CARROLL A. EDSON: The article entitled, "The Motorized Division."

CAPTAIN WALTER K. WILSON, JR.: The article entitled "Current Trends in Use of Engineers in Combat."

CAPTAIN RAY W. CLIFTON: A book review.

LIEUTENANT JOSEPH DASHER: Various translations from the Russian (*Krasnaya Zvyezda*).

●

The Cover

American Army Bombers Over Mount Ranier
Wide World Photo

Contents

PAGE

ADMINISTRATION AND TRAINING PHASES OF LEADERSHIP ---- 5

DIVISION IN HEAVEN ---- 10

LESSONS FROM WORLD WAR II ---- 19

GERMAN INCENDIARY BOMBS ---- 22

DIVE BOMBING ---- 23

THE MOTORIZED DIVISION ---- 24

SOME FUNDAMENTALS OF GERMAN MILITARY OPERATIONS ---- 26

CURRENT TREND IN USE OF ENGINEERS IN COMBAT ---- 30

ARMORED UNITS ON ROADS TO VICTORY ---- 34

WORLD WAR II ---- 36

THE FAR EAST ---- 44

THE BREAKTHROUGH OF THE GERMAN 63D INFANTRY ACROSS THE SOMME, 5-6 JUNE 1940 ---- 46

MILITARY NOTES AROUND THE WORLD ---- 52

FOREIGN MILITARY DIGESTS ---- 58

Dakar ---- 58

Junior Leadership ---- 59

Tanks Against Warsaw ---- 60

A Portable Disinfestor ---- 62

Cooperation between Aviation and Artillery in the Penetration of a Defensive Zone ---- 63

Power-Dive Bombers ---- 65

Heroes of the "Fast Troops" ---- 67

General Wavell on the Training of the Army for War ---- 68

German Tactics in Their Aerial Attacks on London ---- 70

Independent Air Action ---- 72

The Preparation and Execution of Tactical Exercises of the Squad, Platoon and Company ---- 73

The March and Meeting Engagement of Motorized Infantry ---- 75

Motorized Detachment in Holland ---- 77

Battleship or Aircraft Carrier ---- 79

A Day of Action ---- 80

Motorized Reconnaissance Detachment in Combat in Flanders ---- 81

A Few Words to Young Officers ---- 83

Function of Parachutists ---- 83

Tactical Employment of Tanks Under Winter Conditions ---- 84

The Staff of the German Army ---- 86

Technical Considerations for the Engineers Regarding the Employment of the Army Construction Troops in an Advance ---- 87

Palestine, 1918—France and Belgium, 1940 ---- 89

The Tank Company in Forest Combat ---- 90

Reconnaissance by "Schnelle Truppen" (Fast Troops) ---- 91

Building a Bridge Across the Meuse West of Sudan for the Crossing of an Armored Division ---- 94

The Home Guard ---- 95

Parachute Troops ---- 96

The Battle for Arras ---- 97

Changes in Air Tactics ---- 99

Meeting Engagements of Tanks in the Strategical Depth of the Enemy ---- 100

ACADEMIC NOTES, C. & G.S.S. ---- 101

Antimechanized Defense ---- 102

Armored Units, Armament, Organization and Characteristics ---- 103

The Armored Division in Exploitation and Pursuit ---- 108

LIBRARY BULLETIN ---- 113

BOOK REVIEWS ---- 114

DIRECTORY OF PERIODICALS ---- 117

CATALOG OF SELECTED PERIODICAL ARTICLES ---- 117

SUBJECT INDEX ---- 132

NEW READING COURSES FOR OFFICERS ---- 140

BRIGADIER GENERAL EDMUND L. GRUBER
November 11, 1879—May 30, 1941

This picture was enlarged from a chance snapshot taken as General Gruber gave his last salute during the Memorial Day ceremonies at the Fort Leavenworth National Cemetery.

★

LINES FOR GENERAL GRUBER

On Philippine duty, in nineteen-eight,
A young lieutenant, one evening, late,
Declared the artillery needed a song
To sing as the caissons went rolling along.

So he wrote the words and music, too,
And the men who began to sing it knew
That here was a lyric to lift men's hearts
As the caissons headed for distant parts.

And back to the U. S. A. it spread
To shorten the dusty trails that led
To Benning, and Snelling, and Grant, and Custer,
The cannoneers sing it wherever they muster.

It rollicked and rode on the far-flung breeze
And it cheered artillerymen overseas,
At Belleau Wood and at St. Mihiel,
And the Argonne's days and nights of hell.

The young lieutenant who did his best
Became a general, now gone West,
But his heart sings on in that grand old song
Wherever the caissons go rolling along!

From the column "A Line o' Type or Two"
Chicago Daily Tribune, June 6, 1941.

The Administrative and Training Phases of Leadership

Delivered to students at the Command and General Staff School, April 8, 1941

By

Brigadier General Edmund L. Gruber, U. S. Army,
Commandant

In my previous talk on the subject of "Leadership" which was given to the last class, I approached my topic from a consideration of the human element in war. I do not intend to repeat that talk to this class because it is printed in the last issue of the quarterly *Military Review* and will be distributed to you. I shall, however, review briefly the points which I tried to emphasize therein.

Taking as my thesis the statement in the F.S.R. that (1) Man is the fundamental instrument in war, and (2) Leadership is based on a knowledge of men, I pointed out that the first requisite of a good leader is his ability to understand men, to have knowledge of the behavior and mentality of our soldiers. If you know how your men feel, how their minds function, what their emotions are, of what they are thinking, how they react to various events and conditions, you will have taken a long step toward leadership.

From the individual I went to the group because modern war is based largely on the conduct of many small groups. I discussed the influences, good and bad, that affect the group, the problems of our smaller group leaders, and the things that commanders and staff officers must consider in order to organize and control these groups efficiently. I stressed particularly the fact that the command must train the staff and the subordinate leaders to look after the welfare of the men so that the first essential condition of group spirit—comradeship—can be welded in the group.

And then I showed that character is the foundation of all leadership. Character plus professional talents go to make up prestige, and this prestige is what really counts because it measures a commander's influence. Prestige, broad tolerance, willingness to accept responsibility and energy in execution, there you have most of the ingredients that go to make up a good commander.

Today I shall discuss two more essentials of command and leadership, namely, ability as a trainer and capacity as an administrator. We shall investigate in more detail these leadership qualities which you may expect to find in the commanders under whom you will serve as general staff officers. Let us not expect to find these commanders keeping company with such great captains as Hannibal, Marlborough, Frederick and Napoleon. On the contrary, let us look for them among the commanders we know, among the officers who were developed under our great American democracy, among the leaders who went through the same mill in which you are treading. Genius is a rare and elusive quality, and because it flashes so briefly it often fails to produce lasting results. Good military leadership does not necessarily mean great military genius. Get that clearly in your mind. Otherwise many of you may feel a sense of unreasonable frustration in not finding yourselves superlative.

In our Army we have developed few commanders who had the military genius to rate a niche as great captains in a World Hall of Military Fame. Yet in every major war in which our country has been engaged, we have developed a succession of capable commanders, generals who were practical field soldiers and experienced administrators, leaders who were in close touch with their troops and who inspired confidence in their subordinates. What they lacked in imagination and military genius they made up in common sense, a deep interest in the welfare of their men, and perseverance and energy in the exercise of command. They may not have been in the galaxy of stars but they had their feet on the ground of solid military achievement.

Let us therefore survey our own environment and history to see whether we can find an answer right at home. Demosthenes in his address to his fellow Athenians on the "Duties of the State" gave some homely advice in this respect when he said:

"But see how it was in the time of our ancestors, for by domestic not foreign examples you may learn your lesson of duty. Themistocles who commanded in the sea-fight at Salamis, and Miltiades who led at Marathon, and many others who performed services unlike the generals of the present day, assuredly they were not set up in brass nor over-valued by your forefathers who honored them, but only as persons on a level with themselves."

As our first example, let us take the man whom Henry Lee characterized as "first in war, first in peace, and first in the hearts of his countrymen." Let us consider the administrative and training problems which confronted Washington in the winter of 1777-1778, when, in order to maintain his well-chosen strategic position at Valley Forge, he faced the task of supplying his troops in a place where supply seemed impossible. What hours of anxious planning, of harassed transportation, and of frugal allotment must have gone into the project of eking out enough food, clothing and equipment to hold that freezing, hungry army together. How difficult must have been the job of drilling and training troops under such circumstances. But Washington was a good administrator. He had shown that in his able administration of the estate of Mt. Vernon which he inherited from

his brother. He knew how to get the best out of a good quartermaster, Greene, and a good drillmaster, von Steuben. Despite that terrible winter, "it was with increased numbers and much-increased efficiency that the Army prepared to open the campaign of 1778."

Then, too, there was much planning and administration in getting the Continental Army to a place, and getting it there on time and in condition to fight. Think of the logistics involved in moving a force several hundred miles with depleted and primitive transportation in colonial America 160 years ago. On 30 August 1781 Washington, with his army in position around New York, received word that Cornwallis had holed up in Yorktown and that De Grasse was in Chesapeake Bay ready to cut the English off by sea. Leaving only 4000 men behind to guard the forts of the Hudson, Washington set out for Virginia with the remainder of his Army, embarked it aboard the French Fleet at the head of Chesapeake Bay, and disembarked it opposite Williamsburg where he was joined by Lafayette and his troops.

Just 28 days after leaving New York, Washington had his army of 16,000 men and his artillery neatly in position investing Yorktown. The American troops that carried those redoubts which were manned by stout British regulars were not the ragged, badly-officered soldiery that had been chased out of Long Island four years earlier. They were a well-trained, well-officered, hard-hitting fighting force, built up and disciplined by Washington during the hard years that had intervened. They had marched against time as no army ever marched. There you have an example of planning and training and military administration as exemplified by our first Commander-in-Chief.

Our next example is Winfield Scott—"Old Fuss and Feathers" as his men affectionately called him. As Howden Smith points out, he was the *only* American commander who never lost a battle; a record equalled in modern times by only one other great commander, Marlborough.

Scott was an organizer and trainer of troops par excellence. In 1814, General Moses Brown turned over to 29 year old Colonel Winfield Scott a division made up of six infantry regiments and told Scott to train them. "In three months" says a biographer, "Scott welded his division into the best body of soldiers the country had possessed since Smallwood's brigade of the Maryland Line, the pattern for Washington's Continentals." British regulars recoiled when they felt the assault of Scott's division at Chippewa and Lundy's Lane.

After the War of 1812 Scott did for the whole American Army what he had done for his division there on the Canadian border. "He may truly be said to have been the grandfather, if not the father, of the modern American Army. He impressed it permanently with the stamp of his personality. His training methods, in so far as primary elements are concerned, have never been altered."

By the time of the Mexican War, Scott had given the United States a real army—small, it is true, but a first rate fighting force, thoroughly trained in sound tactics laid down in drill regulations which he had prepared. This fact is not commonly known and appreciated. "The Army of 1846 . . . was emphatically Scott's Army, the product of his genius, trained along the lines he had developed during the War of 1812 and in the period subsequent thereto. . . . The light batteries were probably the best at that time in the world . . . the three dragoon regiments would have been classed as elite troops in any European Army. . . . The infantry regiments contained an unusual proportion of long-service men, especially in the noncommissioned grades. . . . Their march discipline was superb, their combat efficiency beyond praise. . . ."

Scott's report of his Mexican campaign reads like a text book on military administration. After the capture of Mexico City, he showed his marvellous talents as an administrator of military government. "He was particularly careful," says Howden Smith, "to deal with the Mexicans as fairly as possible, taking pains to avoid any belligerent or arrogant step which might tend to undermine the precarious prestige of the improvised government functioning at Queretaro. He ordered that the courts of the country should be undisturbed, religious places respected, hospitals and asylums guarded, the posts uninterrupted, so far as was within the bounds of military expediency. . . . He could claim, within a couple of months, to have created a higher state of order and public safety than the country had known for years."

These developments in our Army under Scott must be kept in mind when we think of the military exploits of our commanders in the Civil War fifteen years later. Their achievements did not spring full-blown out of nowhere. They had their roots in the fine training and discipline which Scott gave the American Army before and after the Mexican conflict. Scott had trained practically every higher commander who later won distinction fighting either for the North or South. They were all his "young gentlemen," as he called them—Lee and Grant, Sherman and Jackson, McClellan and Beauregard, Meade and Thomas, Bragg and Ewell, Heintzelman and C. F. Smith, the Johnstons, Longstreet and Pickett, Sedgwick and Hunt, Reynolds and Rosecrans, Hooker and Porter, etc., their names are legion—all were his proteges. Well has it been said: "It may not be true that the Duke of Wellington said that the battle of Waterloo was won on the playing fields of Eton and Harrow; but there can be no question that the Civil War was fought and won on Scott's battlefields in Mexico."

If you study our Civil War, you will also find that ability in training and in military administration marks the competent leader. Henderson termed Lee "undoubtedly one of the greatest, if not the greatest, soldier who ever spoke the English tongue." Consider his talents in organizing and training the Army of Northern Virginia. Consider the administrator's keen insight in picking able subordinates—Jackson, Hill, Ewell, Pickett, Longstreet, Stuart, and others. A poor commander might never have thought them fit, and a jealous commander might have been fearful of their fame. Lee's stature grows in the reflection of his able subordinates.

And then think of how Lee handled his problems of supply—the Federal blockade tight as a hangman's noose around the throat of the Confederacy; short of food, uniforms, iron, cannon and gunpowder, just a thin, ever-diminishing trickle of the things an army needs; while against him stood arrayed the industrial might of the North and the importable resources of the world. Yet Lee kept that army of his going for four years until it was forced to lay down its arms through physical exhaustion and military starva-

tion. Think of Lee as a master strategist and tactician, yes; but to me he looms even greater as an organizer, trainer, and administrator.

Grant did not attain Lee's tactical brilliance but he possessed an overabundance of tenacity and perseverance. As an administrator he had that practical ability to brush aside the insignificant and minor factors in order to lay bare the essentials in stark simplicity. Early in his career (Shiloh) he learned to appreciate the full effect of the moral and material factors in war. He based his training on the influence of these factors. His understanding of their influence enabled him to smash through to victory no matter how grave the emergency.

Grant's leadership was marked by three traits of character: willingness to accept responsibility; singleness of purpose, which means clear judgment to distinguish the essential from the minor issues—or as we say here at Leavenworth, from the monkey-meat; and finally relentless vigor in the execution of that purpose. He had that driving energy which invigorates the commander's decision and constitutes the real nine-tenths of an order, that buoyant energy which is reflected in a staff when it "hops to it" just as soon as the commander's intentions are known.

Think of the administrative capacity of the man who in a few months changed the reverse and confusion of Chickamauga into the success and good order of Chattanooga. Think of how quickly Grant reorganized and objectively trained the Army of the Potomac, inspiring it to respond like a well-balanced team to his personal direction while he at the same time exercised supervision as supreme commander of the other armies. Maybe that is why Lincoln, in reply to critics who demanded Grant's removal because of alleged insobriety, asked them to find out what brand of whiskey Grant preferred so he could send a barrel to some of the other Union generals.

Sherman was more skillful than Grant at maneuver but did not quite measure up to him in a slugging fight. What he lacked in pugnacity, he made up in careful planning. He was a master administrator and logistician. His cunning and resourcefulness, especially in supply and administrative matters, would make our modern G-4's look like rank amateurs. His mind was an encyclopedia of practical information, and what he did not care to be burdened with mentally went into that little black note-book of his, something I advise every general staff officer to adopt for himself. When we see the large and numerous staffs, both general and special, in all our headquarters today, we must marvel at the mental capacity of Sherman who combined in himself all the functions of a general staff. He was a perfect example of that coordination which in music we find in a symphony orchestra. The next time you gaze upon his likeness, note the size of his cranium, a mark of the intellectual capacity of a man whose will was as tough as his body. What a fortuitous circumstance that this great commander, this unequalled general staff officer, should also have been the man who in 1881, just 60 years ago last May, directed the founding of the school at Fort Leavenworth, which was later to become our general staff college.

We come next to the post Civil War period. In the middle 70's, the Sioux and Cheyennes were on the warpath. Fighting on horseback, armed with the latest magazine rifles and plenty of ammunition, numbering thousands of warriors under hardy and crafty leaders, they scorned the small mobile detachments sent out against them and felt they could easily elude the larger and more cumbersome forces that tried a pursuit. To catch and destroy them in the spring, fall, or summer seasons, when their movements were free and there was ample grass on the prairies for their horses, was a virtual impossibility.

George Crook, who had just cleaned up the renegade Apaches in the wild and rocky highlands of Arizona, was given the mission of corraling and pacifying the warring Plains Indians. In studying the situation, Crook noticed certain significant facts about these Indians during the bitter winters in Montana, Wyoming and the Dakotas. For one thing, in the winter the Indians' ponies became weak and ill for want of fresh grass upon which to graze. The tribes and their animals were unable to stand the wintry blasts and had to be sheltered in valleys or ravines. That meant that in winter the hostile tribes had lost their most coveted military asset—mobility. Moreover, the Indians themselves were wont to congregate when the cold weather arrived and hibernate throughout the winter in central villages where they had amassed enough food and fuel to serve their collective needs. That meant that the Indian's one and only supply depot, as you might call it, was immobilized and brought within striking distance. Let the winter villages of the Sioux and Cheyennes be found and destroyed—and the blow would break the backs of the tribes for years to come.

Crook planned his campaign carefully. Three problems loomed large. First, he didn't know exactly where the central Indian village was, which meant that armed reconnaissance was necessary; second, his troops needed fodder and supplies just as much as the Indians did, but he had to move his supplies while the Indians had already collected theirs; and, third, the bitter cold was as dangerous as the enemy, a circumstance which required thorough training in winter combat as well as careful administrative preparations in the way of clothing and equipment. Crook planned and provided a remedy in each case.

On 1 March 1876, with ten companies of cavalry and two of infantry, Crook left Fort Fetterman for the Big Horn country on the long journey in search of "Crazy Horse" and his Sioux warriors. Crook's plan worked. On 16 March, one of his heavy scouting columns found the Sioux village and surprised it. Only a grievous error on the part of one of the column commanders prevented victory and "Crazy Horse" got away. All through the summer the Sioux and Cheyennes frolicked to their hearts' content; but in November, Crook was ready again and this time he did not fail. His cavalry found the large Cheyenne village near the Powder River, and burst in upon it like a torrent. Over 200 lodges went up in smoke, and over 700 Indian ponies were captured. The Cheyennes were ruined as a military power. Even "Crazy Horse," the Sioux, implacable warrior though he was, came in, temporarily disheartened, and gave himself up. Through careful planning, training and military administration, Crook had scored decisive victory.

Leonard Wood was another commander whose name will live long as a great military administrator and trainer. His splendid work as military governor of Cuba after the War with Spain, and later as military governor and as gov-

ernor general of the Philippines, won him the reputation of being without a peer as a colonial administrator. Never was an honor more richly deserved. To see in true perspective the magnificent results attained by Leonard Wood and his colleagues as colonial administrators, one need only compare the flourishing political, social and economic condition of Cuba and the Philippines after 30 years of development under American control with the backward condition of the overseas colonies and dependencies of certain European powers after 300 years of exploitation.

After the Spanish American War, Cuba was in a tumult, wrecked by the long heritage of Spanish misrule, torn by the effects of the war itself, shot through with radical designs for achieving a premature independence. Into this whirlpool of disaffection and unrest, President McKinley sent Leonard Wood. "I want you to go down there to get the people ready for a republican form of government," was all the President said. "I leave the details of the procedure to you. Give them a good school system, try to straighten out their courts, and put them on their feet as best you can. . ."

Some day you may get an assignment like that, gentlemen. Wood simply took it in his stride. He worked like a Trojan, 16 hours a day. No project for betterment was too hard to tackle. No detail of local government was too inconspicuous to escape his watchful supervision. At the end of his term as governor, Cuba was well-governed and happy, freed from disease and political and judicial corruption, ready for independence and deeply appreciative of the country which conferred that independence upon her. Said the Secretary of War in behalf of the President in thanking Wood when he had completed his task: "Out of an utterly prostrate colony a free republic was built up . . . This record stands alone in history, and the benefit conferred thereby on the people of Cuba was no greater than the honor conferred upon the people of the United States."

Wood's career is an epic of military administration. Read it and you will be inspired. But he was also an efficient trainer of soldiers. When the World War broke out he undertook to train the 89th Division at Camp Funston. A flood of draftees began to pour into the camp. Wood had no cots, no blankets, no blouses, no hats, no overcoats. On his own responsibility he bought five thousand suits of blue denim for his men, and scraped up the rest of the equipment as best he could. There were no guns or rifles. He had his men whittle out wooden guns and rifles with which to train. "Train the men, and when they aren't working, give them wholesome recreation." "Do it your own way," he told Major Howland, one of his staff officers, "but do it. I'll back you up."

And then comes the World War and Pershing. He did not grow in military stature overnight. He had served as a staff officer in his early career. He had cut his eyeteeth as a trainer and administrator in the Moro provinces of the Philippines. In 1916 he repeated this work on another delicate mission on our Mexican border. But few saw in him at that time the Army's great "Captain of Industry." Throughout the World War, he more than maintained America's fine record of efficient military training and administration. When he arrived in France and avowed his intention of forming an American Army, a French officer said: "But you have no General Staff. It takes thirty years to organize a General Staff." Replied Pershing quickly: "It never took America thirty years to do anything!" He trained and built the A.E.F. into a fighting machine which was second to none. From top to bottom it became a strong, powerful, and supple armed force. Even in the externals of military organization, Pershing saw to it that there were no shortcomings. An amazed French general, leaving Pershing's headquarters, exclaimed: "Every time I go in there, I feel—how do you say it—like a Boy Scout!"

"He made and executed plans to keep the fighting men supplied continually and in abundance with everything they needed to fulfil their mission. His comprehensive mind embraced all their requirements—everything from laces and dubbin for hobnailed shoes, to cartridges for the rifles of the infantrymen and shell for the great guns of the artillery. . . to sum up, Pershing proved himself a superb organizer, a great business man. To take care of countless needs of two million men—to arrange provision for four million men—the imagination staggers at the achievement. . . ."

Pershing's "S.O.S." was the greatest organization the world has ever seen. In eighteen months it handled 18,000,000 ship tons of supplies. It imported, repaired and operated thousands of locomotives and freight cars; built 1,000 miles of railway; put up 3,000 miles of telephone and telegraph wire; constructed storage warehouses and terminal facilities to handle a daily traffic of 45,000 tons of freight; cut 200,000,000 feet of lumber and 4,000,000 railway ties; fed and equipped 1,200,000 fighting men in battle; dredged channels, built docks and cantonments; kept motor transport moving; erected automobile shops, one of which alone made over 500,000 spare motor parts and overhauled 11,000 vehicles.

Truly, in modern war, the military commander must be a good trainer of men and an administrator of the first order. He must have an orderly mind which constantly directs the staff to develop and to have executed the plans which he projects. With respect to the staff, he must keep its size down, organize it for efficient operation and train its members for their jobs.

But he should never do their work—if he can help it. If he does, he fails to realize that the real purpose of the staff is to assist the commander, and not vice-versa. By the same token, a staff officer who unloads his problems, dumps undigested information, or piles redundant studies on his commander, fails in his job.

A higher commander may get by as a fair strategist and average tactician, but he can never get by as a slip-shod trainer or a mediocre administrator. His tactics may be rough in spots but his grasp and understanding of the mechanics of the military professions must be of a high order. The conduct of war is based on a skillful adaptation and application of the technique of modern science. New means are always giving it a different form. These must be appreciated by a commander and properly applied in the training of his troops.

Most wars are fought and *won* under the leadership of competent, painstaking and efficient commanders—falling short of genius, it is true, but always going ahead and reaching their objective by hard work and competent service. Remember, that even your military genius must be assisted by a lot of able commanders who can comprehend the intentions of their brilliant captain, and have the ability and the energy to carry out his decisions. Napoleon's star set

quickly when he no longer had at his side Desaix and Lannes, Massena and Berthier. And in history, many a military genius has been brought to grief when opposed by a steady, tenacious and energetic commander.

In conclusion, let me commend to you the study of our great American military commanders. I have given you a snap-shot of some of them, of those whom I considered outstanding in their times and who exemplified the qualifications which I believe are essential for high command and leadership. But there are many others who also exemplify these qualifications and whose careers will return great profit to you by further study. They have served their country well and have never failed to bring honor and glory to our Army.

Perhaps there are some of you who have heretofore been persuaded to study the lives of brilliant military stars of foreign armies because they have been labelled with the strawberry mark, "made in so and so." A little of this is all right and I do not decry it, but I believe you will learn far more by studying the careers of our own military leaders. Always keep in mind that you cannot easily transplant foreign ideas of military command and leadership on the national characteristics of the American soldier, or on our national institutions, or on the traditions of the Army of the United States. We found that out in the World War when our Allies, with the best of intentions, tried to direct the training of our troops, and even sought to parcel out American troops under foreign control and leadership. If you believe in the destiny of this great American Republic, you will oppose every such tendency just as our military leaders did in 1917-1918.

And so I repeat, study our American commanders first because they are the product of the system to which you belong and from which you spring. Since this system has consistently produced able commanders who have led our armies to success in the past, there is every reason to believe that it will do so in the future. And I believe the American people can have every confidence that it will.

"War means fighting. The business of the soldier is to fight. Armies are not called out to dig trenches, to throw up breastworks, to live in camps, but to find the enemy and strike him; to invade his country, and do him all possible damage in the shortest possible time. This will involve great destruction of life and property while it lasts; but such a war will of necessity be of brief continuance, and so would be an economy of life and property in the end. To move swiftly, strike vigorously, and secure all the fruits of victory is the secret of successful war."

* * * * * * *

"Always mystify, mislead, and surprise the enemy, if possible; and when you strike and overcome him, never give up the pursuit as long as your men have strength to follow; for an army routed, if hotly pursued, becomes panic-stricken, and can then be destroyed by half their number. The other rule is, never fight against heavy odds, if by any possible manoeuvering you can hurl your own force on only a part, and that the weakest part, of your enemy and crush it. Such tactics will win every time, and a small army may thus destroy a large one in detail, and repeated victory will make it invincible."

—General Thomas J. ("Stonewall") Jackson

Photo by U. S. Army Signal Corps.

AIR-LANDING INFANTRY ALIGHT

Division in Heaven

The Staff Work of Air-borne Troops

BY

LIEUTENANT COLONEL LEO DONOVAN, *Infantry*

AND

LIEUTENANT J. J. GLEASON, *Infantry*

"Five thousand balloons, capable of raising two men each, could not cost more than five ships of the line; and where is the prince who can afford so to cover his country with troops for its defense as that ten thousand men descending from the clouds might not in many places do an infinite deal of mischief before a force could be brought together to repel them?"—Benjamin Franklin, in 1783; *Writings*, IX, 155-56.

"There is nothing new, except what is forgotten." So the saying goes, and certainly it applies to the case of air-borne troops. On the 10th of May, 1940, and the days immediately succeeding, the world was startled by news of military developments which seemed wellnigh beyond credence. It was not that tanks and aviation had wrought wonders along the lines of offensive war, for the potentialities of these weapons, long suspected by astute military experts, had received considerable journalistic attention and the report of their current achievements was accepted as not at all beyond the realm of the probable. It was that other things—fantastic developments—were happening. The renowned and powerful fortress of Eben-Emael, key of the Belgian defense lines guarding the Meuse and the Albert Canal, a gun-studded mass of masonry which loomed proof alike against bombs, artillery, tanks, shock troops, and gas, had fallen within a few hours of the time the attack began. Scores of miles behind the Dutch defensive positions, *which had not as yet been successfully penetrated,* the airports of Rotterdam were in the hands of the foe, vital bridges had fallen to the invader, and savage assaults were being launched upon the environs of the Hague by gray-clad infantrymen. A startling technique was being employed by Germany—a new "Angriffsmittel,"* the Reichswehr called it—a "secret weapon," the headlines proclaimed.

As a matter of fact, save in an applicatory sense, there was nothing new and nothing secret about what was being done. Simply, the situation was that air-borne troops—parachute troops and air-landing infantry—were functioning for the first time on a large scale in actual warfare. "Vertical Envelopment" had arrived and was passing its practical test. The nature of air-borne troops and of their

*"*attack-method*"

organization and equipment, the principles applying to the way in which they could be successfully used, had been the subject of study at one time or another during the past ten years by the armies of Russia, Germany, Italy, France, England, and the United States.

February, 1933, witnessed an early and striking experiment in air-landing technique, conducted by our own American Army. During annual maneuvers in the Panama Canal Zone three batteries of 75-mm pack howitzers under the command of Lt. Col. Edmund L. Gruber were flown by plane—with all necessary personnel and equipment—from Bejuca to Chorrera on an emergency defensive mission. Within an hour after the loading began at the point of departure the batteries were in position at their destination ready to fire upon the enemy. No order for transportation by plane had been previously expected by the participants, yet the operation was executed without mishap. This is believed to have been the first time that artillery was carried by air in actual military maneuvers.

As far back as September, 1936, a force of 1200 men, with 18 artillery pieces and 150 machine guns, had been transported by plane in Russian military maneuvers, and landed 100 miles behind the battle position of a defending force; from which point the air-landing troops attacked the enemy in rear. Major-General Archibald Percival Wavell, who, as leader of the British military mission, viewed this episode, said: "Such operations must be seen to be believed." There was no lack of other such practical demonstrations.

In the year 1937, in the April issue of the French *"Revue d' Artillerie,"* appeared a long and singularly instructive article, which surveyed the subject of parachute troops and air-landing infantry. It showed that a wealth of military literature on this topic existed, dealing not only with rudiments and general principles but also with actual experiments, and with such finer phases of the subject as medical opinion regarding the exact physiological effects of parachute jumping on the troops who engaged in it.

There is a wide gap, however, between military theory and experiment, however sound, and the actual appreciation of a new technique by the conservative body of armies at large. Only the German army seems to have carried through seriously in the matter of parachute and air-landing forces. Russia, to whom goes the credit of having pioneered boldly in the field, seems in late years to have been seized by doubt of the new method's validity. Other armies appear to have dabbled in it, but to have regarded it, in final analysis, as a sort of spectacular military sideshow rather than as a practical way of winning wars. So Germany got the jump on the rest of the world. She trained and equipped battalions of parachute troops with the utmost thoroughness. She studied and analyzed the problems of air-landing infantry. Then, in May, 1940, the dividends were declared. Eben-Emael, defensive masterpiece though it was by all accepted standards, went down before a company of Nazi parachutists. The seizure of the Rotterdam airports was similarly accomplished. The attack on The Hague, which, together with other behind-the-lines assaults, diverted and fully occupied the attention of the Dutch general reserve, was attempted by a powerful air-landing force, Lieut.-General Count von Sponeck's 22nd Division. The back of the Lowlands was broken by swift blows from above. Soldiers from the sky were the men who did the work.

Let two eminent witnesses evaluate the role of the air troops in the operations mentioned. Said the French Premier, Paul Reynaud, on May 21, 1940: "The truth is that our classic conception of warfare has run counter to a new conception. The basis of this conception is not only in the massive use of armored divisions and of fighting airplanes; it is in the disorganization of the enemy rear by deep raids by parachutists, who in Holland just failed to capture The Hague and who in Belgium seized the most powerful fort

Associated Press Photo.

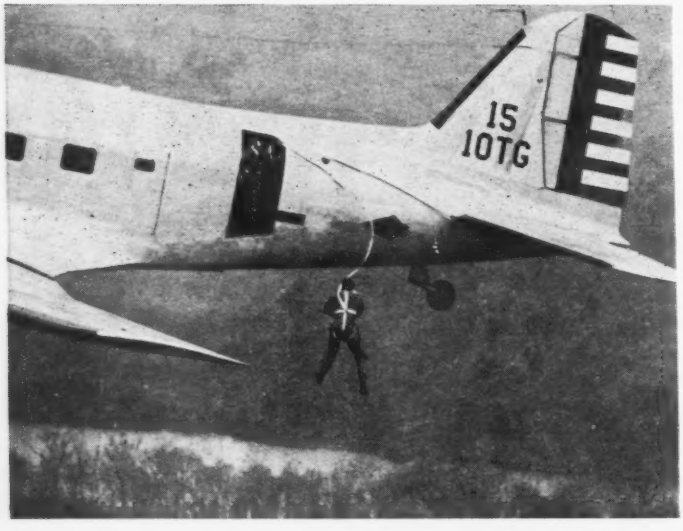
"ON THE WAY"
(U. S. Parachutists.)

of Liege . . ." More specific still is the evidence supplied by the Dutch Foreign Minister, E. N. van Kleffens, who says: "Parachutists, troop-carrying airplanes, and fifth columnists gave the reserve troops of the army so much to do that they were prevented from coming to the aid of the front-line troops . . . As a consequence of the German invasion from the air . . . our soldiers were confronted with the necessity of launching attacks in our difficult, flat terrain, a task our High Command had always hoped would fall to the lot of the enemy to attempt . . . Were it not that our reserves had been exhausted by the incessant fighting (against air-borne foes) in the heart of the country since the first hours of the war, these troops would now have proved invaluable. They could—and were meant to—have occupied these last lines of resistance, letting through the troops retreating from the east while shielding them, and allowing them to reorganize for further action. As it was, the with-

drawing troops had to retreat and at the same time occupy the new lines, thereby shouldering the whole burden of the final engagement. Is it to be wondered at that in those circumstances they were unable to hold their own?"

After all this had happened, to be sure, the air-borne technique began to be subjected to the closest and most assiduous scrutiny. Our military magazines and the military journals of the other nations of the world have been carrying numerous excellent treatments of the subject. These articles have probed, and have clarified in progressive degrees, such elements in the matter as the organization, equipment, training, missions, and tactical principles of parachute and air-landing troops.

For the purpose of the present discussion it will suffice merely to summarize in a brief way the nature of the missions upon which the air-borne forces may be sent. These missions fall into one of two general classifications: first, air-borne troops can be employed to further the immediate aims of a large scale offensive operation by striking in rear of an enemy defensive position—for instance, to block the movement of hostile reserves, or disrupt lines of enemy communications. Second, air-borne troops can be used for the purpose of attacking and destroying vital installations far behind the enemy lines, such as utilities, railroads, and supply or ammunition depots.



U. S. Infantry School Photo.

"HITTING THE BREEZE"

Missions of the first class are, of course, the more typical. The sky-troops are simply used as a coordinated element among the other combined arms. The operations of the air-borne force must contribute directly to the success of the operations of the ground force. The landing of the air-troops is timed in such a way that they will have to hold their objective in rear of the enemy position for only a brief period, thereafter being relieved by the friendly ground forces which will meanwhile have effected a penetration. The sky-troops can hope for little more than a fingertip hold at best, so usually it must be somebody on wheels who will break through and reinforce them. Thus, the German parachutists who seized the bridges of the Maas during the German offensive against Holland were reached on the third day and reinforced according to plan by Nazi armored elements which had plunged through the gap opened by penetration of the Dutch defensive position.

The difficulty of assigning sky-troops to missions of the second class mentioned—sabotage and the like—is that such missions often contribute little to decisive offensive operations, and may result in the sacrifice and loss of the air-borne force. The recent British descent into Calabria is an example. Nevertheless, such raids may be vital. "Paralysis," says Liddell Hart "is the true aim in war . . ." A quick punch in the solar plexus by an intrepid parachute force can leave a foeman very weak in the biceps, so it would be error to assume that an assignment of this nature invariably violates the Principle of the Objective.

Bearing in mind, then, the general nature of air-borne missions and objectives, let us turn our attention to the extremely delicate problem of how a divisional staff is to plan an operation in which the sky-troops are to be used.

* * * * * * *

First to be emphasized is the factor of *precision;* and here the stress is not intended to be a mere inspirational urge toward an unattainable goal. Faultless precision in air-borne operations is a practical necessity—an absolute necessity. The sky-troops, obviously—far more so than units of any other nature and purpose—move always along a fine razor edge of timing and coordination. Theirs is not the happy faculty of being able to muddle through. No friendly neighbors support them on right and left, nor do helpful reserves and services stand ready to aid them in rear. Staff miscalculations which in the case of other operations, though harmful, might not produce consequences beyond quick repair, can doom an air-borne mission to certain, disastrous failure. The "fog of battle," must be cut to a minimum here, no matter what prodigies of staff engineering and effort may be required in order to do it.

Second, it must be remembered that the divisional staff has, practically speaking, the job of *organizing* the air-borne force. The sky-division is, under the present conception of the matter, a *task,* not a type, unit; and its components will be decided upon and fitted together with an eye to accomplishing the particular mission which happens to be assigned. It is true that, in a general sense, the Army Commander sets up the air-borne outfit by designating the division that is to do the job and by making the necessary attachments. It is the work of the division staff, however, under our current system, to study the tables of organization of each unit of the division, to modify those tables to any extent required by the nature of the mission, and to indicate what personnel and equipment are to be included in the expedition and what are to be left behind. It will ordinarily happen that elements which are not organically a part of the division will be required. By reason of the limitations of weight capacity and the nature of air-borne objectives, 75-mm pack howitzers and machine-gun antiaircraft units will usually be employed.

Third—and here is the consideration which makes air-borne staff technique a matter of concern for *every* divisional staff officer—the fact that this is a task force leads to the corollary that *any* unit which can be transported by air may be called upon at *any* time in the course of operations *to become an air-landing force,* or an element therein; and when

this happens the division's *own, regular staff* may have the job of overhauling the division for aerial purposes and planning the operation assigned. There is no reason to believe at present that a deft, practiced staff of sky specialists will be sent down from GHQ to reconstitute the division and prepare it for its new mission. The identical staff of officers that piloted the outfit when it plodded along on "terra firma" will probably have to handle it when it speeds through the sky on wings. A divisional staff officer may not, in the ordinary course of affairs, have to be a jack-of-all-trades, but one sideline he would do well to acquire is air-borne technique, else he may have some bad moments when summoned to help move his division by plane and land it somewhere right side up. A word to the wise is sufficient!

Let us, now, suppose a typical situation, and see how it would work out in terms of staff planning and staff procedure. Let us leave out all consideration of the command feature, and carefully avoid intruding the tactical aspects of the problem save in the instances where those tactical aspects become bound up with staff calculation itself. We just want to see what the staff of the air-landing division is up against in preparing the operation. Say that our Blue forces, fighting their traditional foes, the Reds, have been operating offensively in hostile territory and have been stopped dead by heavily reinforced Red opposition. The Blues prepare for a penetration, to be effected a month hence, meanwhile proceeding to move up the required offensive elements and poising two armored divisions to exploit the breakthrough. Seventy-five miles behind the Red defensive position lies the Blue objective, Metropolis, a city of about 100,000 inhabitants. Metropolis is a railroad center, the heart of the local automobile road system; has airports, a fair amount of industrial concentration and, in other respects, the usual features to be found in a midwestern American city of similar size.

Down from Army Headquarters comes word that the Blue 100th Division will operate during the offensive as an air-landing force, parachutists being attached; and will assist the advance of the Blue First Army in the capture of Metropolis by occupying that city on D-day and disrupting hostile command and communication facilities. The air-borne movement will be designed in such a way as to give maximum help to the ground offensive.

The staff of the 100th Division stand not upon the order of their getting to work, but get to work at once!

Lt. Col. Sharp, Division G-2, the Intelligence Officer, a thin-faced individual whose photographic memory and X-ray eye would qualify him as a formidable cross-examiner, here at last has a job to challenge his talent. He must collect, by way of preparation, a fund of exact data with respect to the enemy and the terrain in Metropolis and the vicinity, doing it in detail over an extended period of time. He will need precise information as to Red defensive works; the number, type, location, equipment, habits and morale of the Red troops in the city; similar facts with respect to Red units in outlying areas; the airports and ground on which the landings are to be made; possible alternate landing areas; the obstructions and defenses of Red airdromes; the location of utilities, destruction of which would cripple the enemy; the position of office buildings suitable for observation posts; the location of garages where transportation might be commandeered; the location of Red headquarters and supply and ammunition depots; the attitude of the civilian population; the availability and potentialities of Blue sympathizers within the city; the exact form and

Associated Press Photo.

"Look Out Below"
(U. S. Parachutists.)

nomenclature of the Metropolis street grid. That catalogue touches merely the high spots. Col. Sharp must get his information from the War Department G-2, from the G-2s of the Blue First Army and adjacent units, from spies, maps, aerial photographs, and skillful reconnaissance aviation.

He should draw up a careful and comprehensive Intelligence Plan for the projected operation. It might be mentioned here that the whole idea of having an Intelligence Plan in G-2 work has lately been subjected to much criticism —and justly so—for the simple reason that the plan is so ramified, laborious and slow to prepare that nine out of ten times the battle is over before G-2 gets it finished. An air-borne operation, however, is one place where an Intelligence Plan is singularly appropriate and useful. Two factors justify and require it in such a case: first, there will be ample time—here, for instance, a month—in which to prepare the plan for a sky-troop mission; and, second, so great a sum and diversity of information will be needed that only the use of an Intelligence Plan can enable G-2 to keep track of what he has decided to do.

Col. Sharp's Intelligence Plan will give some idea of the scope of his task. Glancing at the first two columns of his Plan, headed "Essential Elements of Information" and "Indications," we should probably see something like this:

(1) "Will additional Red forces be moved into Metropolis prior to D-day?—Detrainments in Metropolis—Movement into the city of Red forces now situated nearby.

(2) "Will the enemy construct additional defensive works or obstacles which will interfere with our landings?—Activity at Metropolis airports—Defensive measures taken by Reds to prevent landings of parachute troops.

(3) "Will the enemy discover our intentions?—Increased protection of airports—Rumors among Red population of the city.

(4) "What Red reserves outside of Metropolis will be able to intervene on D-day, including their strength and composition?

The Intelligence Plan might go on to list as further "Essential Elements of Information": "What antiaircraft defenses will the Reds have in the city on D-day? Where will motor transportation be available in Metropolis? Will the Reds attempt to protect or to destroy communications, public utilities and supplies?" Nor would the list end here.

A reader can easily imagine the complexity of the specific orders and requests by means of which the G-2 will seek to secure this vital information—not to mention the problems involved in correlating this mass of data, once it is obtained, and maintaining secrecy in the course of its distribution.

Nevertheless, G-2 has no monopoly of the onus when it comes to staff work for an air-borne operation. The whole group will have to work their heads to the bone. Pulling his weight with the rest will be a certain brisk, leathery-faced Lt. Col. Mobile, Divisional G-3, the Operations Officer.

To begin with, Col. Mobile will comb through his divisional tables of organization and decide, in the light of the assigned mission, what personnel he should recommend to the Commanding General as necessary to be taken along. Light, mobile fire power will be at a premium here, so one may rest assured that every machine gunner, auto-rifleman and mortar virtuoso is going to get a ticket. Military administration and maintenance, on the other hand, will be temporarily in eclipse during the lively weekend behind the Red lines, with the result that administrative and maintenance personnel will doubtless languish at home when the division hops off for Metropolis. G-3 will modify the divisional tables of organization with an eye to meeting the requirements of the air-borne mission. The result will be a table designating the men who are to go and those who are to remain. A sample page from such a document might look like this:

SAMPLE TABLE 1

INFANTRY REGIMENTAL UNITS

Organization	Personnel to be transported by air		Personnel to remain	
	Officers	Men	Officers	Men
Hq & Hq Co (Regt) (less 3 Bn Secs)	8	102		14 (a)
Antitank Co	6	162		17 (b)
Medical Det (less 3 Bn Secs)	2	10	2 (c)	5 (c)
Aggregate	16	274	2	36

(a) Includes: 1 Sgt., Mess; 1 Sgt., Supply; 1 Sgt., Transport; 1 Cpl., Clerk; 1 Armorer; 7 Cooks and cook's helpers; 2 Motor mechanics. - Total 14.

(b) Includes: 1 Staff Sgt., Transport; 1 Sgt., Mess; 1 Sgt., Supply; 1 Cpl., Clerk; 3 Cpls., Transport; 1 Armorer, 7 Cooks and cook's helpers; 2 Motor mechanics. - Total 17.

(c) Includes: 2 Officers (dentists); 1 Tech. Sgt.; 1 Record clerk; 2 Dental technicians; 1 Sanitary technician.

Moreover, Col. Mobile may reach the conclusion that the peculiarities of the operation require the attachment of some special units, and will thereupon recommend that this additional support be requested from Army.

Next, G-3 must tackle the problem of what home airports, and how many, are available and suitable for use in his embarkation. He, the Divisional G-4, and the Army Air Officer will confer upon this; likewise upon the type of transport planes to be provided, and the time and place for them to be ready. An "Air Transport Movement Table" will be drawn up, an excerpt page from which might have the appearance of Table 2.

SAMPLE TABLE 2

AIR TRANSPORT MOVEMENT TABLE

1	2	3	4	5	6	7	8	9	10	11
Serial No.	Serial Cmdr	Air Transport Unit	No. Airplanes Required	Departure Airport	Troops to be loaded	Hour Loading begins	Hour of Departure	Destination	Hour of Arrival	Remarks
					D - DAY FIRST WAVE					
1	CO 901st Par Bn	1st Gp (T)	41	Municipal	901st Par Bn	H - 58	H - 28	I	H	C-39 Airplanes throughout this table unless others specified.
2	CO 902d Par Bn	2d Gp (T)	41	Fairfax	902d Par Bn	H - 58	H - 28	II	H	
3	CO 20th Inf	3d Gp (T)	60	Municipal	Hq & Hq Co 20th Inf; 1st Bn 20th Inf	H - 18	H + 12	I	H + 45	
4	CO 21st Inf	4th Gp (T)	60	Fairfax	Hq & Hq Co 21st Inf; 1st Bn 21st Inf	H - 18	H + 12	II	H + 45	
5	CO 2d Bn 20th Inf	5th Gp (T)	55	Municipal	Div Hq; MP Det; 2d Bn 20th Inf (-Co G); Btry "A" 901 CAC (AA)	H + 32	H + 62	I	H + 95	

G-3 and the Army Air Officer work out together the plan of aviation cooperation in the movement—fighter protection en route, bomber attack to soften up the foe for the division's landing, a "fighter umbrella" to guard the air-landing force while it is getting its feet on the ground.

Arrangements must be made, further, to get the 100th Division to the selected airports, to house them for the time being, once they arrive there and to provide practice exercises in enplaning and deplaning.

All this, be it remembered, is over and above the planning of the actual ground combat phase of the operation. The latter presents three particular difficulties to the G-3: first, the division is constrained to operate with very limited means, since the weight of the heavier weapons precludes their being taken along; second, there will be an initial handicap of tactical disorganization, since the landing from the air may somewhat scatter and confuse the elements of the division; and third, G-3 is rolling dice against time, since his force both from the standpoint of food and ammunition can be self-sustaining only for an extremely short period. If that good old armored corps fails to arrive on the scene climactically in the last reel, a lot of Blue scalps will most certainly be hung up in the wigwams of Metropolis.

On the other hand, G-3 can rely on a number of tactical advantages—and they are gems of price. He will enjoy the best of air assistance, both bomber and fighter, throughout the transport and landing phases of the operation. His parachute battalion acting as a covering force is a type unit of elite raiders, specially and thoroughly trained to clear out opposition fast so that the division can come down safely. If all goes well he can count on surprise—the surprise that blinds and stupifies—when that force of his swoops down out of the blue. Finally, he knows that at the very instant he drops on Metropolis, a hard-hitting Blue First Army, seventy-five miles away, will be smashing into the Red lines, wielding all the offensive might of teamed air, foot, tanks, engineers and artillery.

Weighing these elements, and also the normal factors which enter into the situation, Col. Mobile will formulate the various combat plans which are to be submitted for his General's consideration.

Last but by no means least in this picture is the 100th Division's G-4, the Supply Officer, quiet, methodical, business-like Lt. Col. Stores. His is the extremely complicated task of drawing up a supply plan for the operation. How long should the air-borne force expect to maintain itself before being relieved by the ground troops? How great a time margin should be added to the estimated figure in order to play safe? How much ammunition should the division take; and, more pertinent still, how much is it *able* to carry? What about the type and number of rations that can feasibly be included? Col. Stores and the G-3 will have many a session on these and similar questions, for G-3 may be inclined to include weapons whose voracious fire power simply cannot be supplied by reason of weight limitations. Between them, G-3 and G-4 will thresh the matter out, shaving down personnel, food, and ammunition to quotas practical for an air-borne project.

Then comes the question of equipment. An infantry division being a little military cosmos, has no end of accessories which would prove cumbersome baggage on a plane ride. Dispensing immediately with the more obvious impedimenta, Col. Stores will probably decide to leave at home such articles as barrack bags, record chests, field desks, cooking outfits, bedding rolls, tents, typewriters and similar items.

The problem of loading is one which presents itself. What special packing and crating arrangements are going to be necessary? How are the loads to be lashed in? Will loading apparatus of any particular kind have to be used to get the equipment and weapons into the planes? How are the loads to be grouped? Properly fitting in the various items of arms, ammunition and equipment has all the attractive simplicity of working out a post-graduate jig-saw puzzle. To put .30 caliber machine guns in with .50 caliber ammunition, or vice versa, or guns without shells, or shells without guns, would hardly be forethought on the part of Col. Stores. Yet the nature and capacity of his vehicles in this case are bound to exercise a restrictive compulsion. G-4 may soon find himself reduced to the delirious plight one experiences, when, caught unaware, one first sits down to solve that vicious old brain-twister about getting the three Missionaries and three Cannibals across the river in one boat.

Be that as it may, G-4 will finally gather up his notes and will prepare two tables: a "Summary of Planes Required for Transporting Troops, Equipment, Rations, Water and Ammunition," and a "Plan of Loading Personnel, Supplies and Equipment." Random pages from each of the two documents respectively might be set up somewhat as shown in Tables 3 and 4.

SAMPLE TABLE 3

SUMMARY

PLANES REQUIRED FOR TRANSPORTING TROOPS, EQUIPMENT, RATIONS, WATER AND AMMUNITION

100th Division (Air Landing)

1. PLANES REQUIRED TO TRANSPORT MEN AND EQUIPMENT.		Planes required
Unit		
FA Bn (75-mm how pack)		
Bn Hqs	5	
Btry (8 planes) × 3 =	24	
Total Bn	29	
(Second Bn or Second Wave	29)	58
Inf. Bn and Det.		
Hq & Hq Det)		
Com Sec)	5	
Med Sec)		
3 Rifle Cos	36	
Heavy Weapons Co	12	
Total Bn	53	
	× 6	
(6 Similar Bns -	318	318
Regt. Hq & Hq Co, AT Co, and Med Det.		
Regtl Hq & Hq Co & Med Det	7	
AT Co	13	
	20	
(2 similar units × 20 -)		40

SAMPLE TABLE 4

Plan of Loading Personnel, Supplies and Equipment

FOURTH HOWITZER GROUP

QUANTITY	UNIT	WHERE CARRIED	UNIT WEIGHT	TOTAL WEIGHT	REMARKS
1	Officer	Pilots compartment	220	220 (1)	Assistant Executive
1	Sergeant	Pilots compartment	220	220 (1)	Chief of Section
1	Corporal	Main Cabin	220	220 (1)	Gunner
1	Private	Main Cabin	220	220 (1)	Cannoneer, Automatic Rifleman
1	Private	Main Cabin	220	220 (1)	Cannoneer
1	Private	Main Cabin	220	220 (1)	Cannoneer
1	Private	Bombardeer compart	220	220 (1)	Telephone & Radio Operator
1	Private	Bombardeer compart	220	220 (1)	Telephone & Radio Operator
	Total weight - personnel			1760	See note (1)
1	Rear trail	Bomb Bay	95	95	See figures 1 and 5
1	Axle	On rear trail	65	65	See figure 5
1	Staff, less sponge	On rear trail	5	5	Normal traveling position
1	Top sleigh	Bomb bay	121	121	See figures 1 and 5
1	Tube	Bomb bay	221	221	See figures 1 and 5
1	Bottom sleigh	Bomb bay	203	203	See figures 1 and 5
1	Cradle	Bomb bay	100	100	See figures 1 and 5
1	Front trail	Bomb bay	236	236	See figures 1 and 5
1	Breech block	Main Cabin	121	121	Wrapped in canvas manta
2	Wheels	Main Cabin	48	96	See figure 8
1	Chest, accessory, M1. complete	Main Cabin	33	33	Contains sighting equipment, etc.
1	Chest, took, M3, complete	Main Cabin	37	37	Contains roll, tool, M4, etc.
4	Bars, lifting	Main Cabin	7.5	30	Used for aiming stakes when firing
1	Handspike, M1	Main Cabin	6	6	
1	Can, oil, recoil, filled	Main Cabin	9	9	
	Total weight - Howitzers & access.			1378	
50	Rounds, shell, 75mm. Pack Howitzer	Bomb bay floor	21.4	1070	See figures 1, 3, and 8
1	*Axle, RL-27	Main Cabin	5	5	See note (5)
1	*Bag, Water, Sterilizing, w/cover	Main Cabin	11	11	See note (5)
1	Carton, miscellaneous signal equip.	Main Cabin	15	15	See note (2) for contents
1	Finder, range	Main Cabin	70	70	
2	*Flagkits, M-113	Main Cabin	3	6	See note (5)

Thereafter, Col. Stores proceeds to the task of working out plans for divisional resupply and evacuation. They will keep him quite busy till D-day. By that time preparation is over, and the curtain rises on action swift and intense.

* * * * * * *

Warfare is a progressive and endlessly changing science. New techniques are devised which prove mainsprings of victory for their inventors. In warfare intellectual resiliency and initiative—as much as physical strength and material weight—bestow success upon armies. In the airborne operation we find a dynamic technique, new at least in the sense that it has gone hitherto unappreciated. Its practical worth, its lightning-like power, have been indisputably settled; yet its potentialities have only begun to reveal themselves. Does it not behoove us, then, to master this technique of the sky in our own laboratory of military study and experiment? Should the air-landing force be, after all, a *type* unit, specially trained for its work? If so, what will be the composition of such an organization? How will it be trained? For what missions will it be employed? Can new weapons be found to add to its power? The army that answers such questions may be well repaid for its effort.

"Into Action" *U. S. Infantry School Photo.*

Lessons from World War II

By

COLONEL KINZIE B. EDMUNDS, *Cavalry*

Prove all things; hold fast that which is good.
—I Thessalonians, 5-21.

THE DEFENSIVE

One profound impression made on the minds of those who participated in World War I was the strength of the defensive position. The history of the West front during the greater part of that war tells a story of repeated, bloody and unsuccessful assaults in which men were mowed down by the concentrated fire of machine guns and artillery and in which no decision was ever secured until one of the belligerents was exhausted. The superiority of the defensive over the offensive appeared to be firmly established.

The events of World War II present a complete reversal of this condition. The offensive has everywhere been successful in an astoundingly short space of time, at the cost to the defeated side of immense numbers of prisoners and quantities of materiel, and with almost insignificant losses to the attacker. With the single exception of the Albanian front, a mountainous terrain, nowhere has the offensive been stopped or even materially slowed down. This is by far the most important development of the current war and the one which must be disposed of before any minor matters are discussed.

Why did the defensive which was found so effective in World War I prove so complete a failure in World War II? And conversely, what are the factors which have made the offensive so completely successful?

In the opinion of this writer, the answer to the first question is found in the failure to appreciate the necessity of counterattack and to make adequate provision for it; the failure to grasp the potentialities of mechanization and motorization and an incorrect estimate of the role of aviation.

Our defensive doctrine is based correctly on two equally important elements, a force to hold and a force to counterattack. Merely passive resistance, however strongly entrenched, will never succeed against a determined and well equipped opponent who is free to concentrate his efforts against one portion of a defensive front which must be held at all points. The function of the holding force is not to obtain a decision simply by defensive fires; it is primarily to delay the attack and disorganize it so that a formed reserve can concentrate behind the threatened area, maneuver to its attack position and have the superiority necessary to conduct a successful counterattack, destroying its opponent or ejecting him from the ground he has gained.

In the issue of *Life*, April 28, 1941, there is an account of a successful counterattack by fifteen light British tanks against thirty heavier German tanks which had penetrated the position at Tobruk. This is the correct principle. The attacking force is exhausted and disorganized through its advance and the opposition it has encountered. A formed and fresh reserve can defeat it even if inferior in numbers provided it has equal mobility, adequate armament and is used with determination at least equal to that of the attacker. In Poland, Belgium and France there was an evident lack of reserves properly located, a failure to give what reserves were available the necessary mobility, and finally a lack of energy and determination in their employment.

These conditions in turn were due primarily to the failure to appreciate the rapidity of maneuver permitted by mechanization and motorization and, particularly, the added striking power given to mechanization by the fire support of masses of airplanes. The tanks and airplanes of the attacker should have been met by concentrations of the tanks and airplanes of the defender; they were not so met. The defeated forces had tanks and had airplanes. It is true that they were inferior in these arms, but they were sufficiently strong to conduct a successful defense had the means been intelligently used. The failure was in doctrine and application of doctrine rather than in means.

THE OFFENSIVE

The operations of the attacker present nothing new *in principle*. Most of them—the operations in North Africa were an exception—were of the attack maneuver known as the *penetration*. In a penetration, a hole is first punched completely through the enemy's dispositions by a concentrated attack on one portion of his front, only sufficient pressure being exerted on other portions to hold his troops in place. The hole being made, highly mobile forces are sent through it directed on critical areas in rear, areas vital to the defender in the conduct of his operations. An encirclement of a part at least of the defending force is thus made. That part is then crushed by concentric pressure on its front, flanks and rear. This is a difficult operation, but there were three examples of its successful use in World War I, at Megiddo, at Vittorio Veneto and north of Salonika. Each resulted in the complete destruction of an army.

In the successful penetrations of World War I the mobile forces sent through the gaps in exploitation were horsemen. The Germans in World War II used mechanized and motorized forces for the purpose, gaining thereby in rapidity and depth of maneuver. They made the further innovation of supporting these forces by fire from airplanes, adding to and complementing the artillery fire habitually used on such missions.

It was these added factors that gave the Germans the superiority always necessary for success in the offensive. The mistake should not be made, however, of believing that their operations were conducted entirely by mechanized, motorized and air troops. These form only a small fraction of the German Army, most of whose divisions are made up of foot troops with animal-drawn transportation. The offensive was conducted by *all* components in coordinated action, but it must be concluded that it was the action of mechanized and motorized forces and aviation, unforeseen and unprovided for by the opponents, that tipped the scales to success of the German arms.

Fire from airplanes on enemy ground troops was not new. It had been used in the first World War to a limited extent, but usually on harassing rather than support missions. In the Spanish Civil war it was used frequently as a substitute for artillery fire. The failure of the Allies and ourselves to develop and perfect this type of action may be laid, to a degree at least, on the influence of the Douhet Theory, to be discussed later, with its emphasis on the concentration of air effort for bombing operations on distant objectives.

The Germans on the contrary, while not discarding bombing operations, concentrated on securing the most perfect air-ground liaison attainable. Their success was remarkable. Adopting methods similar to those used in the infantry-artillery combination, they placed air liaison officers in the same vehicles that carried the commanders of units of the armored force. Communicating with the airdromes by radio, it is said that these liaison officers could have their Stukas over the field within fifteen minutes after they received a request for support.

Generally speaking, the same arms present on both sides tend to oppose and neutralize one another. Infantry fights infantry; cavalry is opposed by cavalry; the greatest threat to artillery is the enemy's counterbattery fire. The mechanized and air attack should have been met by a mechanized and air counterattack, but the Allied mechanized means were scattered and their aviation was not trained to coordination with ground troops. Unopposed by its natural enemies, the German combined mechanized and air assault was decisive.

Engineers

The development of extensive mechanized and motorized maneuver has had the effect of increasing materially the functions of an existing arm, the *Engineers*. Specially trained pioneer troops must accompany the leading elements of an armored force to remove obstacles and mines placed by the defenders, to prepare crossings where none exist, or where bridges have been destroyed, and to strengthen any existing bridges too weak to carry the loads approaching them.

The Germans have also developed specially trained technical troops for the attack of permanent defenses such as the Maginot Line. These are concerned largely with the placing and detonating of explosives.

On the defensive, natural obstacles are made more formidable, artificial obstacles prepared and mines laid. Particularly for flank protection, natural obstacles are frequently developed into barrier lines, the fire defense of such lines being entrusted to the engineer troops constructing them.

Parachute and Air-Landing Troops

The war has made possible an estimate of the value and functions of certain contingents developed during the period of peace after the last war and untested until recently in active operations, *parachute* and *air-landing troops*. The best place to examine their operations is in the German attack on Holland where they were used extensively to seize vital points, bridges, ahead of the advancing ground forces, holding them and preventing their destruction until the arrival of the main body.

Here the operation appears to have been as follows:

The environs of the locality selected for the actual landing, air fields, were subjected to an intense air bombardment to impair the defenses;

Parachute troops with their equipment were dropped. Their principal mission was to secure the landing field and to remove any obstacles placed thereon to interfere with the landing of planes;

Troop-carrying planes were landed and unloaded in repeated trips;

A coordinated attack was then made on the objective.

There appear to have been occasions when parachute troops alone were used, examples being the attack on the Belgian fortress of Eben Emael, a British operation in Italy apparently designed to disrupt internal affairs through the destruction of utilities, and possibly a German landing in Greece ahead of the withdrawing defenders. From all these examples we may draw the conclusion that an objective for air-landing operations should be a vital area of limited extent, that unless confined to parachute landing it should include a practicable airfield and that, unless the complete destruction of the landing force is accepted in advance, the air-landing troops must be reinforced within a short length of time through the advance of ground forces.

Air-landing operations require very careful preparation and planning including all details of the loading of planes and schedules of trips. Rehearsals conducted on and over terrain similar to that selected for the actual operation are advisable. Local control of the air is essential.

Douhet Theory

Another concept advanced since the last war is what is known as the *Douhet Theory*. It is important in having numerous proselytes both in the military service and the press and in affecting in our own army the relations between aviation and the other arms. The current war presents the opportunity for a critical analysis of the doctrine advanced and an estimate of its value as tested in action.

Douhet was an Italian officer who became interested in aviation during World War I. Immediately after the last war he wrote several books in which he advanced an entirely new conception of the conduct of war. His thesis may be stated as, "The defensive on land and sea, the offensive in the air." On the outbreak of war the Army and Navy were to hold the land and sea frontiers. Aviation would immediately proceed on the objective of "mastery of the air" to be attained through destruction of the opposing airpower partly in the air, but particularly by attacks on airdromes and through the bombing of factories. Mastery of the air having been obtained, air attacks would be directed toward paralyz-

ing production of all kinds, control and communication through the bombing of utilities, factories and vital points of the road and rail nets, the attacks continuing to centers of population until the will of the people to resist was completely broken and they would sue for peace on any terms.

Such, in brief, was the Douhet Theory. The idea was new and sensational, finding many enthusiastic adherents. In our own service separation of the air force from the army and navy was sought partly as least—there were other reasons advanced—to permit free application of the doctrine. Opponents were characterized as incurable reactionists.

Nevertheless, these same reactionaries continued to oppose. They pointed out that there was no evidence to support the idea that mastery of the air could be obtained or that bombing would have anywhere near the effect claimed for it. They opposed separation of the air force not because of disagreement with the proposal *per se* but because it was to be used to put into effect an untried and probably false doctrine, a doctrine in direct violation of one of the fundamental principles of war, the Principles of the Objective which requires that *all* means shall be directed in coordinated action on the objective of the whole. To say that the aviation should attack while the army and navy rested on the defensive was pure hearsay.

There was a tendency to disregard combined training with ground troops and even to oppose it when it included air attack on advanced enemy units, the reason allegedly being that such operations were ineffective and costly and that the fire support so furnished could be provided to better effect by the artillery. This attitude was the logical result of acceptance of the theory. Quoting Douhet, "Every aircraft employed in an auxiliary role means one withheld from the attainment of the essential object" (mastery of the air).

The progress of the war has by now given us some data on which to judge the truth of the Douhet Theory. In Poland the mastery of the air was undoubtedly secured promptly and thoroughly; the Polish air force was destroyed on its bases. But German ground forces advanced coincidently with the air attacks; it was a combined operation, and an hypothesis that the Germans could have secured their objectives purely through air operations must be regarded as not proven. The final test of the theory lies in Great Britain. It would be difficult to find a theater or conditions more favorable to its successful application. Air fields and factories, bases and depots are concentrated in an area, the Midlands, but little larger than the state of Connecticut. Subsistence is dependent on maintenance of traffic from seaports congested with shipping. Docks and wharves must continue to function. The whole is densely populated, containing many large cities with their vital utilities.

After the fall of France, the Germans had decided air superiority and possessed air bases within easy striking distance of Great Britain. Since the summer of 1940, England has been subjected to intensive air attack by a superior force. Hundreds of thousands of tons of explosives have been dropped. Yet the British air force is still flying and increasing in numbers; merchantmen are still plying the English Channel; the spirit of the British people remains unbroken. It is unparalleled and insensate destruction without other effect.

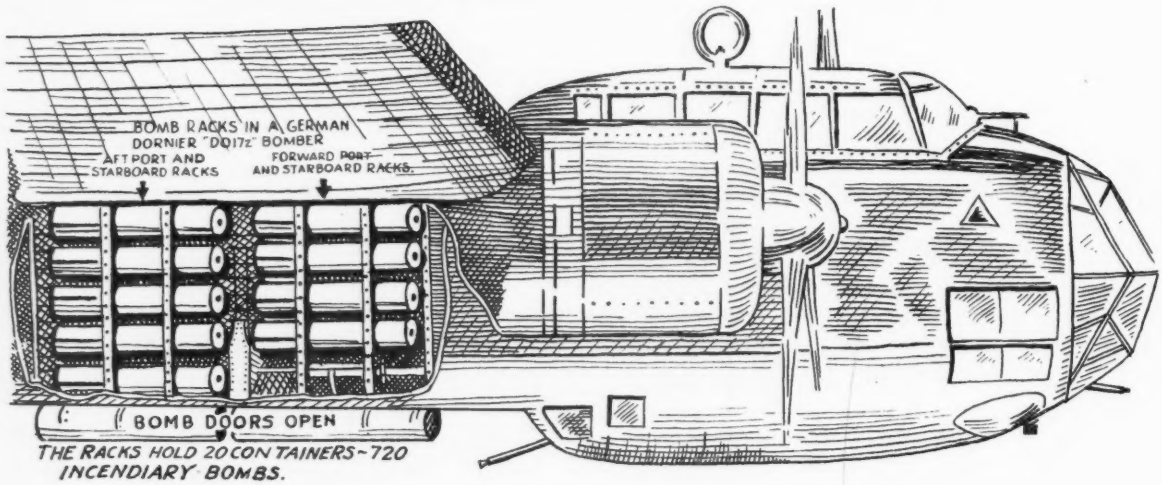
Contrast this with what happened when air and ground forces swept through Belgium and France in a combined offensive. We are nearly in a position to conclude now that if Great Britain falls it will be due either to combined action of air and army in invasion or combined action of air and navy in blockade. The Principle of the Objective appears to be vindicated.

It should not be inferred that the application of this principle requires that air and ground forces operate always in close proximity, that the air contribution must be delivered against enemy front lines as fire support to the ground troops engaged, or that heavy bombers on distant missions will not be used. Operations in rear areas against reserves, communications and installations may be more effective in a given situation than closer support. The bombing of a target a thousand miles away may contribute directly to the attainment of the objective by halting movements toward the contested area or destroying supplies essential to the continued resistance of the enemy. The principle does ban operations which do not have these results or similar ones, the bombing of a town or bridge simply because it is a town or bridge and a vulnerable target, the wasting of means and effort on objects which do not contribute to the common cause.

We should adhere to the Principle of the Objective not for reasons of humanity, but because it is effective, because it improves our chances of winning a war. However, its complete application should lessen materially the material destruction caused by war and casualties among noncombatants.

There is much to be said in favor of an air organization separate from the Army and Navy. The contention that decisions delayed, production held up, by demands for changes in design from Army and Navy, and differences between the two, is probably well founded. Great Britain has a separate air force, and Germany. Of these, Germany at least secures excellent cooperation between air and ground. However, if the separation is urged with the object of enabling the Air Corps to operate on lines divergent from those followed by other components of our armed forces, opposition to the idea will continue.

German Incendiary Bombs


BOMB RACKS IN A GERMAN DORNIER "DO17z" BOMBER
AFT PORT AND STARBOARD RACKS
FORWARD PORT AND STARBOARD RACKS.
BOMB DOORS OPEN
THE RACKS HOLD 20 CONTAINERS ~ 720 INCENDIARY BOMBS.

1

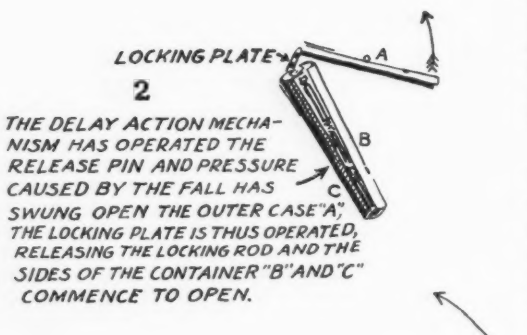
CLOCKWORK TYPE INCENDIARY BOMB CONTAINER JUST AFTER LEAVING THE AIRCRAFT

Clockwork and Electrical Types

The German 1-kilo type (2.205 pound) of incendiary bomb is stowed in an aluminum container, about 39 inches long, holding 36 incendiaries. The one shown here operates by clockwork. The clock-container has a device which begins to tick as it is released from the bomb rack and, at a predetermined moment, the clockwork rotates a cam holding a key in position, which, in turn, closes the third, or outer side, of the container. The moment this is released, it flies upward and in its turn withdraws a fork which holds the locking rod, and which on its release opens the other sides of the case, with the result that 36 bombs are ejected.

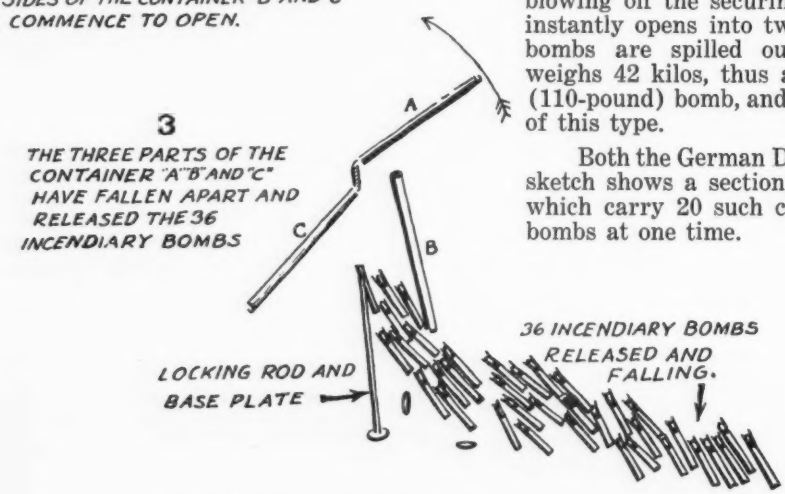
The electrically operated container (not shown here) has only two sides and is hinged at the bottom. When this container is released from the rack, a fuse operates an electric current, which runs up a wire, thereby releasing a small explosive charge, thus blowing off the securing head of the container. It instantly opens into two halves and the incendiary bombs are spilled out. This container, loaded, weighs 42 kilos, thus approximating to the 50-kilo (110-pound) bomb, and can be carried in bomb racks of this type.

Both the German Dornier "Do17z," of which our sketch shows a section, and the "Ju88" have racks which carry 20 such containers, or 720 incendiary bombs at one time.



2

THE DELAY ACTION MECHANISM HAS OPERATED THE RELEASE PIN AND PRESSURE CAUSED BY THE FALL HAS SWUNG OPEN THE OUTER CASE "A," THE LOCKING PLATE IS THUS OPERATED, RELEASING THE LOCKING ROD AND THE SIDES OF THE CONTAINER "B" AND "C" COMMENCE TO OPEN.



3

THE THREE PARTS OF THE CONTAINER "A" "B" AND "C" HAVE FALLEN APART AND RELEASED THE 36 INCENDIARY BOMBS

Article and sketch from *The Illustrated London News*, 1 March, 1941.

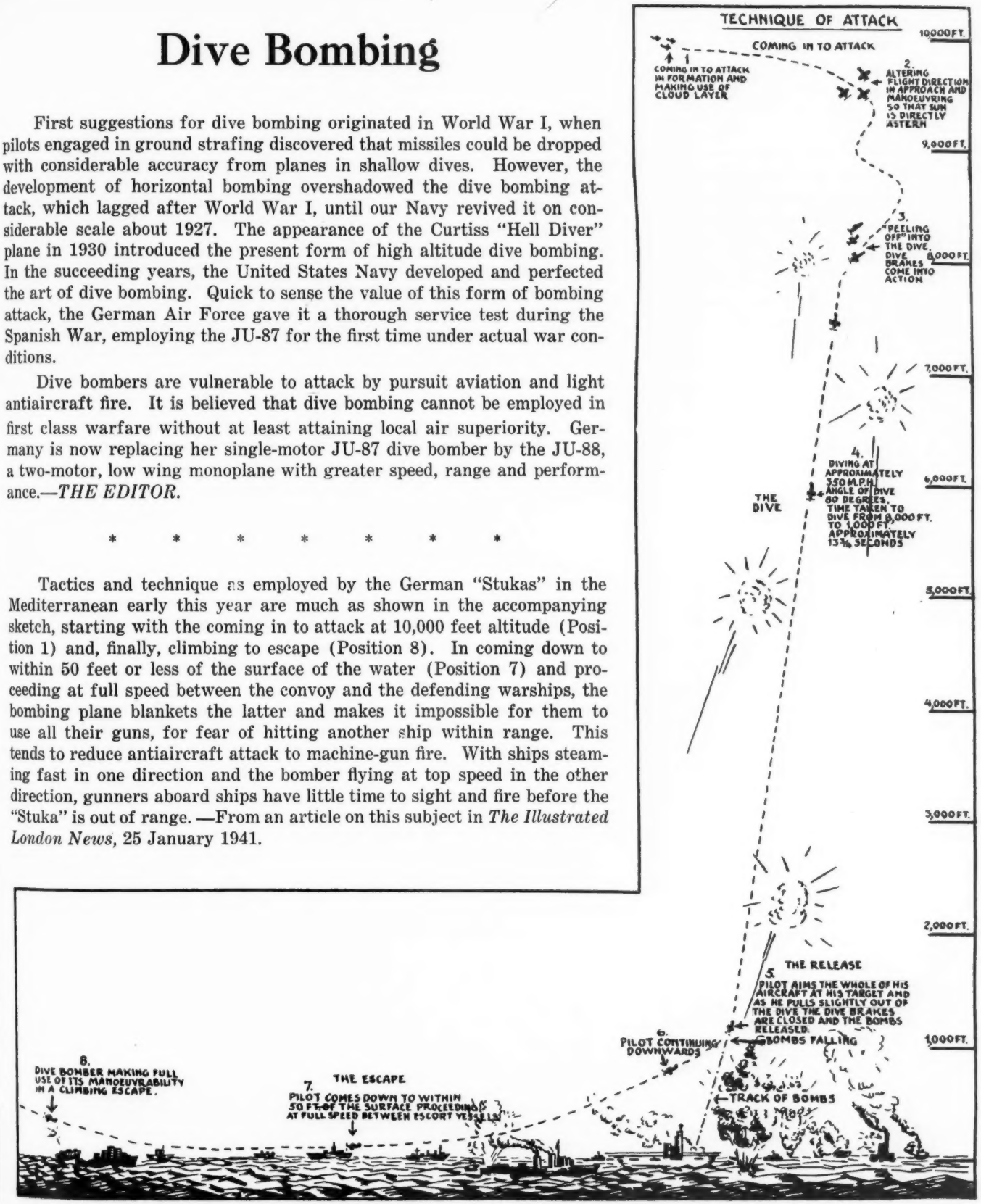
Dive Bombing

First suggestions for dive bombing originated in World War I, when pilots engaged in ground strafing discovered that missiles could be dropped with considerable accuracy from planes in shallow dives. However, the development of horizontal bombing overshadowed the dive bombing attack, which lagged after World War I, until our Navy revived it on considerable scale about 1927. The appearance of the Curtiss "Hell Diver" plane in 1930 introduced the present form of high altitude dive bombing. In the succeeding years, the United States Navy developed and perfected the art of dive bombing. Quick to sense the value of this form of bombing attack, the German Air Force gave it a thorough service test during the Spanish War, employing the JU-87 for the first time under actual war conditions.

Dive bombers are vulnerable to attack by pursuit aviation and light antiaircraft fire. It is believed that dive bombing cannot be employed in first class warfare without at least attaining local air superiority. Germany is now replacing her single-motor JU-87 dive bomber by the JU-88, a two-motor, low wing monoplane with greater speed, range and performance.—*THE EDITOR.*

* * * * * * *

Tactics and technique as employed by the German "Stukas" in the Mediterranean early this year are much as shown in the accompanying sketch, starting with the coming in to attack at 10,000 feet altitude (Position 1) and, finally, climbing to escape (Position 8). In coming down to within 50 feet or less of the surface of the water (Position 7) and proceeding at full speed between the convoy and the defending warships, the bombing plane blankets the latter and makes it impossible for them to use all their guns, for fear of hitting another ship within range. This tends to reduce antiaircraft attack to machine-gun fire. With ships steaming fast in one direction and the bomber flying at top speed in the other direction, gunners aboard ships have little time to sight and fire before the "Stuka" is out of range. —From an article on this subject in *The Illustrated London News,* 25 January 1941.


TECHNIQUE OF ATTACK
10,000 FT.
COMING IN TO ATTACK
1. COMING IN TO ATTACK IN FORMATION AND MAKING USE OF CLOUD LAYER
2. ALTERING FLIGHT DIRECTION IN APPROACH AND MANOEUVRING SO THAT SUN IS DIRECTLY ASTERN
9,000 FT.
3. PEELING OFF INTO THE DIVE. DIVE BRAKES COME INTO ACTION
8,000 FT.
7,000 FT.
4. DIVING AT APPROXIMATELY 350 M.P.H. ANGLE OF DIVE 80 DEGREES. TIME TAKEN TO DIVE FROM 8,000 FT. TO 1,000 FT. APPROXIMATELY 13¾ SECONDS
THE DIVE
6,000 FT.
5,000 FT.
4,000 FT.
3,000 FT.
2,000 FT.
5. THE RELEASE
PILOT AIMS THE WHOLE OF HIS AIRCRAFT AT HIS TARGET AND AS HE PULLS SLIGHTLY OUT OF THE DIVE THE DIVE BRAKES ARE CLOSED AND THE BOMBS RELEASED.
6. PILOT CONTINUING DOWNWARDS
BOMBS FALLING
1,000 FT.
TRACK OF BOMBS
8. DIVE BOMBER MAKING FULL USE OF ITS MANOEUVRABILITY IN A CLIMBING ESCAPE.
7. THE ESCAPE
PILOT COMES DOWN TO WITHIN 50 FT. OF THE SURFACE PROCEEDING AT FULL SPEED BETWEEN ESCORT VESSELS

The Motorized Division

LIEUTENANT COLONEL C. A. EDSON, *Infantry*

In the March 1941 issue of the *Military Review*, at the close of an article on "Streamlining the Offensive," there was a series of charts depicting the successive stages in effecting and exploiting a breakthrough. These showed foot troops, supported by GHQ tanks, making a break in the hostile line, armored divisions pushing through to exploit the break, motorized divisions closely following the armored divisions and supporting and relieving them, and foot infantry divisions in turn following closely behind, and relieving the motorized divisions, which promptly pushed on again in further close support of the armored divisions.

This represented the typical formula which the Germans used in the breakthrough in France, and in other campaigns. Other countries have similarly organized motorized divisions for close support of armored forces.

What are these motorized divisions? How are they organized? What are their missions? How do they operate? What is the situation in this country? What of the future?

Comparatively little has been heard or written of the motorized division, here or abroad. Attention has been focused on the armored forces.

The armored division can occupy but cannot hold ground. That is done by foot troops. But when the going is good, the armored force outruns the foot troops. In the breakthrough to the channel, last year, the German armored divisions averaged 25 miles a day. But they went by spurts, and often were many miles ahead of advancing foot troops. A salient some 200 miles long was created, which was at one point only 12 to 25 miles wide, yet the Allies could not cut it. Had it been cut, and the armored force deprived of supplies and so have run out of gas, it might have been destroyed at leisure, and the entire history of the world have been changed. But the Allies couldn't find a spot they could break through. Why? Because motorized divisions filled the gap between the armored forces and the foot divisions hurrying up as rapidly as possible. The motorized divisions were thus essential to the success of the armored divisions—and of the operation as a whole. Truly they deserve careful study.

Space does not permit any detailed considerations of the mission or operations of the motorized division. In varying circumstances, however, it may seize critical terrain, and hold it until relieved, or may support an armored division.

It may do this in the way already described, or by attacking to clear up an uncertain situation and permit the armored division to advance, or by making a holding attack to permit the armored division to maneuver, or by moving against any hostile forces that are threatening the flanks or rear of the armored division.

It usually operates on a wide front, and often dispersed. It should therefore be able quickly to decentralize control, and in such cases local unit commanders must exercise great initiative in a rapidly changing situation. It is particularly vulnerable to air and armored attacks, and must therefore be strong in antiaircraft and antitank weapons. It very frequently must be the force to meet the counterblow of the enemy, holding positions until relieved by foot infantry. It should therefore be strong in automatic weapons. It is thus evident that while the motorized division is an infantry division, it partakes of many of the characteristics of the armored division, and many of the cavalry division.

There are two conflicting points of view as to the proper organization and armament of the motorized division. According to one point of view, the motorized division, being an infantry division, fights on foot, the same as any other infantry division. It is, therefore essentially a strategic reserve, made mobile by the inclusion of sufficient motors to transport the entire division at one time by its organic means. Under this theory, it should differ as little as possible from the foot infantry division, so as to be suitable for a maximum number of missions.

Under the other theory, any division can be made a strategic reserve at will, by attaching to it temporarily sufficient motors for its transportation. This theory holds, however, that the close support of an armored division is a specialized task, with specialized conditions of combat. Under this theory, various modifications of organization and armament are desirable in order to enable it to function most efficiently in accomplishing this mission of close support of the armored forces. Accordingly the proponents of theory hold, the desirable procedure is to build a new type of division specifically designed to meet the conditions of combat it will most likely encounter.

The tendency has been for countries, when first organizing motorized divisions, to do so under the former theory. Thus, the early German motorized divisions did not differ widely from the normal infantry division. Similarly, with the United States. Our first motorized division—the 4th Division—was organized at Ft. Benning, Ga., last fall. Tables of Organization were published as of October 1, 1940, showing the division to be essentially a normal triangular division, with the addition of 201 half-track personnel carriers to each infantry regiment. These personnel carriers are lightly armored vehicles, intended to protect the occupants from small arms fire, and having considerable cross country mobility, so as to permit moving well forward before the occupants detruck. This facilitates early entry into action.

However, there are indications that European nations are tending towards the theory of specialized organization, on the basis of their experience. It is well known that German tables of organization are very flexible—that, in general, Germany tends to organize any force as a task force, especially designed to accompish its particular mission. It

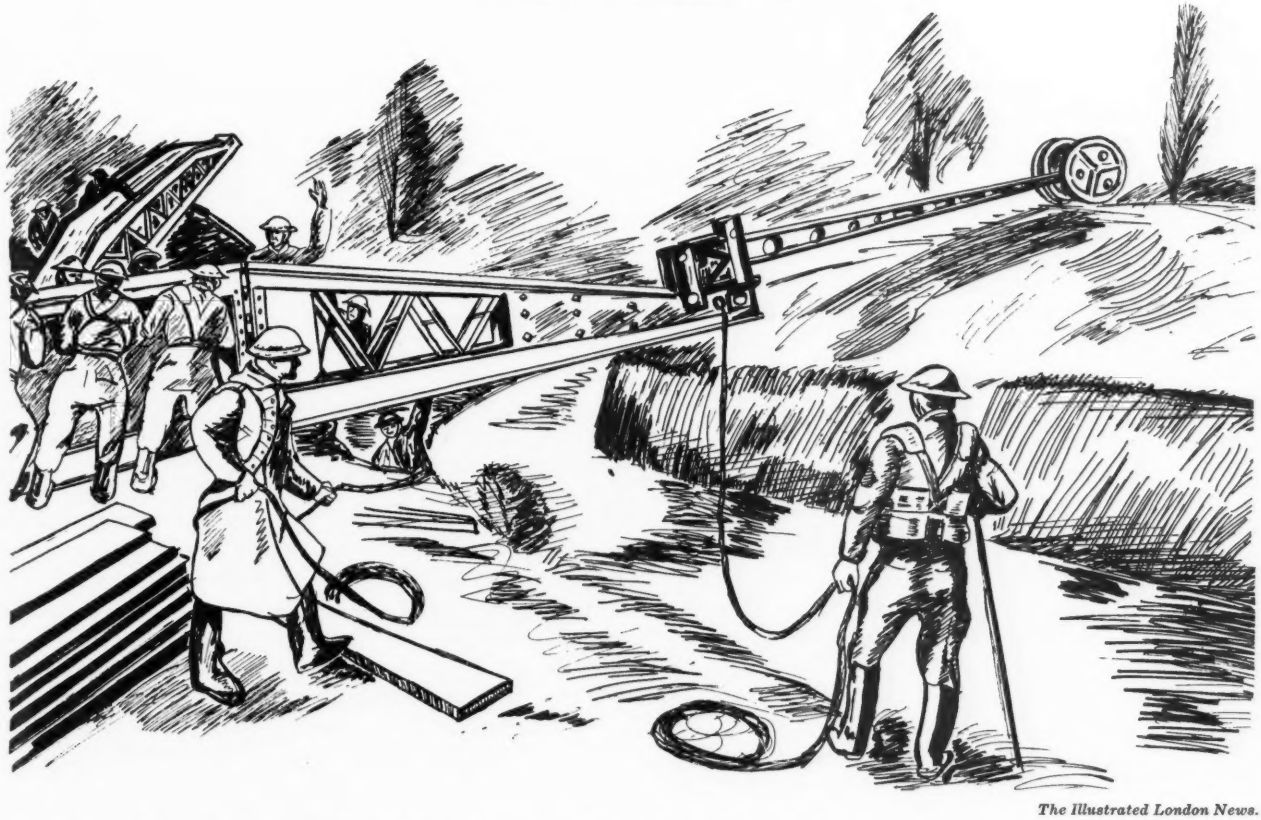
would not be surprising if we learned that in the present organization of the motorized divisions these were modified in many respects, along the lines suggested above.

What will be the developments here? Only time will tell. However, it is significant to note that in an article in the January 1941 issue of the *Infantry Journal*, Major General George A. Lynch, then Chief of Infantry, said "If we find it necessary to give the motorized division special types of transportation, or markedly specialize it in any other way, we should by all means go the whole distance and build exactly the unit we need to carry out its often vitally important special mission in the most efficient manner."

What of the relationship between the armored and the motorized divisions? At present they are entirely distinct. However, the sharp distinctions between branches of the service are becoming more and more blurred. Primarily the motorized division is designed for close support of the armored division. Germany groups together cavalry, armored forces, and motorized divisions as "Schnelle Truppen," and German tactical doctrine groups armored and motorized divisions together in the same corps, so as to assure unified command. In this connection, General Lynch's closing thought in the article referred to above is significant: "We should habituate ourselves to thinking of the whole category of fast troops—armored forces and motorized divisions alike—as a single unit of combat." The War Department at present visualizes the motorized divisions as belonging to the GHQ reserve, and being on occasion attached to Armored Corps according to the needs of the situation.

How large a factor is the motorized division in our army? War Department action indicates a determination to maintain a ratio of 1 to 1 between armored and motorized divisions. On April 30th plans were announced for the organization of additional divisions, to give us six armored and as many motorized divisions. We can anticipate future corresponding increases in these two elements. It is thus evident that motorized divisions, which furnish essential support to armored forces, are to form a very substantial as well as a very important element in our field forces. It would be well for our officers to be giving careful thought to the many and varied problems that will be involved in this new development in our service.

British Defeat Tank Trap



The Illustrated London News.

British Royal Engineers assault field companies with advancing tanks and troops carry bridging, girder sections and decking, on six-wheel trucks. The sapper on the right shifts the launching nose beyond the hornbeam section, to wherever ordered, with his rope. He wears a life saving belt, in case he needs to enter water. Once the obstruction is spanned, an advance party climbs over and lays a transom of timber to take the base of the hornbeam section. Another section of the box-bridge is on its truck in the background. Bridges may be either two- or four-girder, the latter carrying loads of heaviest tanks and vehicles. One section of a Field Company R. E. normally erects a bridge of this type. Taken from *The Illustrated London News*, 1 February 1941.

Some Fundamentals of German Military Operations

By

Lieutenant Colonel James C. Crockett, *G.S.C.*

A mass of information and misinformation has been passed out about the German Army and its operations during the present war.

We have heard the radio commentators and have read the magazine and newspaper accounts of these operations. We are all familiar with the reports of observers and military attaches.

In all of these reports there has been a tendency to stress the sensational and overemphasize the features which were novel and bizarre. This reporting has been done by men of some military training, but in many cases by men lacking military education. There is, of course, an enormous difference between the two.

It is extremely easy to draw erroneous conclusions from battles and even from campaigns. The foundation for success or failure of an army must be sought and studied from the wider basis of history. A glance at history shows us that German soldiers, especially the Saxons, the Austrians and the Bavarians, have broken in battles of most every war beginning with Caesar and including the late World War No. I. During the same period Anglo-Saxon armies have been broken in battle only in a few isolated instances such as in the War of 1812 and at Bull Run in the Civil War.

The German army is not the invincible and invulnerable instrument which so many people claim. Its materiel, its tactics and its leadership are not always perfect. It is not composed of supermen.

This statement is based on two grounds:

1. Personal knowledge of the present German army.
2. History.

To give weight to my statement as to personal knowledge—I have spent more time with troop units of the present German army than any other American officer and until 1937 more time than any other foreign officer. I probably know a larger number of officers of the German army than any other English speaking officer. I have had the opportunity to study the soul of that army as reflected in its officer corps. I know we can defeat the German army in any theatre in which it may choose to fight if we give consideration to certain fundamentals in which the German army has perfected itself.

From these previous remarks please do not think that I underestimate the German army. It is a superbly armed and trained force. Its morale is high. Its leadership superior. It can only be defeated by an Anglo-Saxon army equally armed, trained and led. To use the golf term, no army can give the German army two or three strokes per hole and hope to win. But if we start the play on equal terms we have one great advantage over the Germans. This one advantage has been sought for and praised by all great military leaders. It lies in the military character of our soldiers—it is the decisive advantage.

The success of German military operations is based on seven fundamentals. These are:

1. Morale
2. Totality of Effort
3. Concentration of Force
4. Use of Armored Armies
5. Combination of Arms
6. Offensive Action
7. Tactical Training

Morale.—Following the precepts of Napoleon, Clausewitz and von Molke, the German officer and enlisted man is taught that the human spirit is the most important single factor in war. Every possible means is used to inflame the determination, pride and spirit of self-sacrifice in the soldier. Having these qualities he is told he can not be defeated. German morale is fostered not by comforts and luxuries, but by teaching endurance of hardship, injury and sacrifice.

Totality of Effort.—As is well known the whole German nation is organized as a total force to support the military operations. The size of the fighting force is limited and regulated by the ability of the remainder of the nation to arm, equip, supply and maintain that force. Any activity within the nation which does not contribute to the military effort is regarded as dispersion and when so recognized is suppressed.

Concentration of Force.—The principle of concentration is applied to all military operations. In both small and large operations, the Germans attempt to concentrate superior strength of weapons and men against a point of enemy weakness. They seek to gain surprise by speed and power of their concentration, and by their ability to shift quickly their concentration of weapons and men to other points of enemy weakness. They seldom attack from a concentration where they have not the advantage of numbers, fire power and direction. This is true both tactically and strategically.

Use of Armored Armies.—The Germans organized armored units of the combined arms and at the large training area of Luneberger Heide north of Berlin developed a technique of fire and movement of these units. In a conver-

sation with the then Lt. Col. von Schell as early as 1936, I was told that they were "satisfied that they had developed an effective method of armored attack." The basis of their organization then as now was the battalion of combined arms. First they used the light and medium tanks with auxiliary weapons. The war experience has caused an increase in the proportion of medium and the inclusion of heavies. The tactical action of these battalions of the combined arms is based on fire and movement of their component units.

The success of this technique has, as we know, been great and has rendered obsolete the tactical procedures of World War I. The great German victories in France and the Balkans were won by armored armies supported by air operations.

Combination of Arms.—The German field service regulations say "quick movement demands the early use of all supporting weapons." "The leader who allows his troops to make contact without immediate fire support is guilty of a serious mistake."

Since 1934 the German General Staff has been experimenting with, developing and testing various groupings of the combined arms to be used in the many situations which develop in combat. These groupings are made up by combining one or more units (Einheiten) of the several arms required for the particular situations. These groupings have developed an almost uniform composition but not a uniform amount of the component elements. These groupings almost always consist of the following combination: motorcycles, armored cars, tanks, infantry, antitank guns, machine guns, antiaircraft guns, field artillery caliber 75-mm and 105-mm, engineers and signal troops. The percentage of each arm is determined by the particular situation. All indications from the present campaign in Greece and Libya indicate that these groupings have been reduced in size until they are now about the size of a regiment. Three of these groupings supported by artillery, dive-bombers and other means are fought as a division. Behind these units of combined arms there are powerful armored divisions of combined arms used for exploitation and there are also the regular type of German infantry division used for defensive and flank covering purposes. The Germans carry this combination of arms into the tank battalion. These battalions are composed of both medium and light tanks and usually have attached antitank guns and 105-mm artillery. Supply of all kinds for each arm is based on the units (Einheiten) of that arm. This gives a flexibility of supply which is not disturbed by the tactical groupings described above. Total supply is merely calculated by the supply of total units (Einheiten) of the various arms combined in the groupings. Following the same principle, the General Staff coordination and tactical measures are determined in terms of these groupings of the combined arms.

Offensive Action.—All German tactical training is based on offensive action. In the General Staff School, when a tactical situation is not clear, the student is taught to attack for the purpose of clearing the situation. It is a function of the General Staff to coordinate quickly the resulting actions and give unity to the command effort. A basic principle of German tactics is the immediate exploitation of any local success. The Germans hold that the immediate exploitation of a minor success often leads to decisive results. To make exploitation possible, the combined arms must be available to each echelon of command.

Tactical Training.—Theory in tactics and in strategy is frowned upon by the German General Staff School. It is regarded as amateurish and dangerous. They use the case system. That is, a specific situation must be stated and solved. Tactical training is given almost entirely by means of free maneuvers on the map and on the ground. No fixed divisional organization is used in this training. The divisional organization is continually changed by varying the combination of arms. At the "Kriegsakadamie" (Command & General Staff School), the tactical exercises both on the ground and on the map are conducted so that the officer (Commander) and his general staff oppose either the instructor or another student group. Immediate decisions and oral orders are required. Very little information of the enemy is available or is given out. Movement is not restricted by control features. Only factors of time, space, terrain, fire power and mobility control movement. Coordination of effort is assured by the General Staff during movement, and is not attempted by elaborate plans before movement.

In all tactical training, the Germans use a system of training the next higher grade. For example in squad problems, the privates are rotated as corporals. The regular corporal conducting or assisting in the conduct of the exercise. The same system is used in all other echelons of command. The tactical principles taught may be summed up as follows:

1. There are no rules in tactics
2. Mobility—Units must be organized for fast movement
3. Main effort—(Schwerpunkt). Each unit makes a main effort
4. Surprise—Gained by speed and power of attack
5. Immediate fire support for movement
   Fire and movement applies as much to tanks as to infantry. The combination of tanks of various types with other weapons is to assist fire and movement.
6. Offensive action
   The Germans teach that attack:
   - Disarranges enemy plans
   - Creates opportunities for aggressive commanders
   - Determines enemy strength
   - Retains the intiative

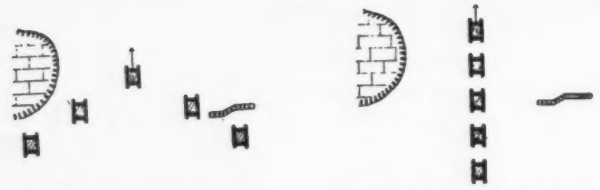
Let us now look at some of their tactics as applied by their armored divisions.

Tanks.—The Germans usually do not deploy their tanks in wave after wave at regular intervals and move forward in an inflexible mass. The tanks are fought by what we would call reinforced battalions which utilize the terrain and advance by fire and movement. The Germans teach that fire from a moving tank is ineffective. The heavy weapons of tanks mutually support other tanks which are moving against the enemy resistance. Antitank guns and accompanying artillery assist in this covering fire. The sketches on page 28 show the right and wrong measures taken by a tank platoon in the particular case stated.

The Tank Platoon in Battle

Methods of Employment

Incorrect — CASE 1 — Correct



To choose a wide formation for the advance because some of the vehicles encounter obstacles and are held back.

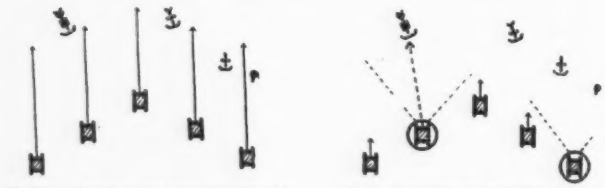
To choose a narrow, deep formation, with all vehicles immediately behind the platoon leader. Compactness is secured.

Incorrect — CASE 2 — Correct

To enter into the fire of combat in deep formation because too few weapons can be brought in action (in this case, only those of leader's tank).

To start fire of combat from a broad formation. All weapons can be brought in action.

Incorrect — CASE 3 — Correct



To drive all tanks so that a number of targets are overlooked due to tanks obstructing each other's vision.

To have some of the tanks halt briefly, in turn, to observe and fire on enemy weapons so as to take full advantage of the accuracy of fire from the halted tanks.

Incorrect — CASE 4 — Correct

To have all tanks attack an antitank gun when in movement. Hits are difficult from fast-moving vehicles and, due to restricted effectiveness, the personnel of the antitank gun can attain good results.

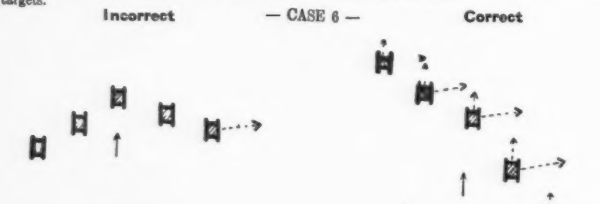
If a part of the platoon halts and provides fire protection for the attacking tanks: one's own losses will thus be small and the AT gun will be put out of service by the effective fire of the halting tanks.

Incorrect — CASE 5 — Correct

For the platoon's tanks to observe only toward the front. Restricted observation to the sides results in having the platoon overlook dangerous targets.

For the two outside tanks to extend their field of vision by turning of the turret, in order to find active AT guns.

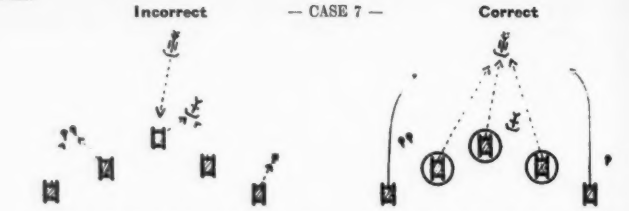
Incorrect — CASE 6 — Correct



For platoons to move in broad formation with an open flank. Vision and effectiveness of fire are meager on the flanks.

To echelon the platoon in depth toward the open flank, in order to provide ample field of fire to the flank and front.

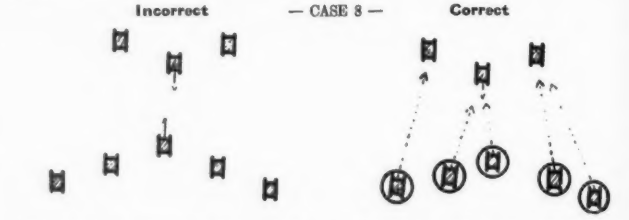
Incorrect — CASE 7 — Correct



For a first wave platoon to engage infantry targets. This causes it to miss the dangerous enemy, the AT gun.

For the first wave platoon to restrict itself to seeking out and silencing AT guns.

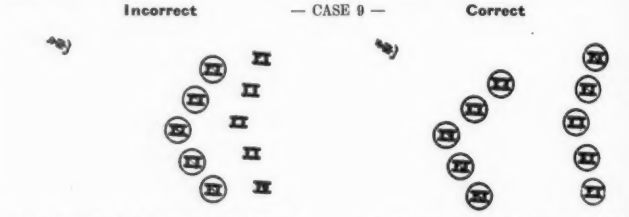
Incorrect — CASE 8 — Correct



To continue the advance when meeting hostile tanks. Fire from moving tanks is not very effective.

For all tanks carrying armor-piercing weapons to go into position at once and to ward off the attack from a halted position.

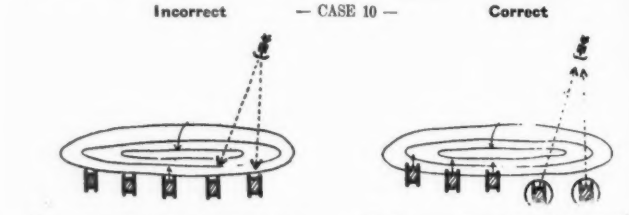
Incorrect — CASE 9 — Correct



To continue the advance, when a platoon, in front, is halted. A close grouping develops which may be fired upon effectively.

To seek cover at some distance from the platoon ahead, in order to avoid massing of tanks and in order to split up hostile fire.

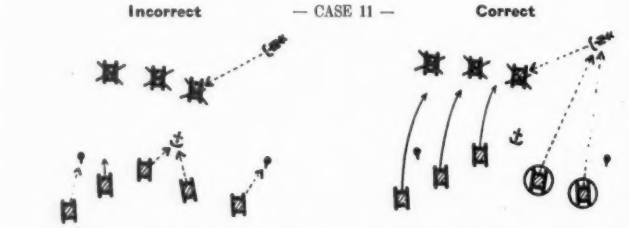
Incorrect — CASE 10 — Correct



To pass through a ravine simultaneously, so that no vehicle is ready to fire.

For the groups to pass through the ravine by infiltration and to be secure from surprises.

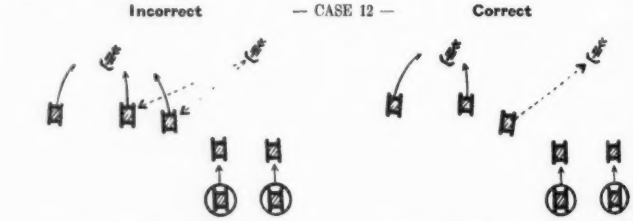
Incorrect — CASE 11 — Correct



To adhere to the mission (to destroy the infantry), when the platoon ahead, through enemy AT defenses, is suffering severe losses.

To depart from the mission and to engage the dangerous enemy.

Incorrect — CASE 12 — Correct



Fo r the part of the platoon attacking the AT gun to have only this target in mind. This results in tanks becoming prey to further enemy defense.

For the platoon leader not to be concerned with the AT gun which is being attacked by two tanks. He should be observing so as to employ his platoon further (in this case, to resume advancing as a security group).

Armored Infantry.—It fights as all other German infantry in (Einheiten) groups supported by a combination of arms which consists of engineers, machine guns, antitank guns, 75-mm howitzers, 150-mm howitzers, motorcycles, armored cars and usually attached 105-mm gun howitzers.

The report by Colonel Soidan entitled, "Break Through Across the Meuse River on May 13" describes the advance beginning at 5:30 AM May 10 of the von Kleist columns, and how these columns reached the Meuse on the morning of May 13. The hour of the crossing attack set at 4:00 PM.

An article recently read in a German magazine (*Militärwissenschaftliche Rundschau*), issued by the German War Ministry, gives a detailed description of the initial crossing made by the III Battalion Armored Regiment No. 4 at Monthermé (Mont-er-ma) on May 13. We know that this regiment was part of the armored division so we can now have a look at their method of its employment.

From 1:00 PM to 4:00 PM the Stukas and bombers bombed the enemy positions in and near Monthermé. The armored artillery (105-mm) was brought up to support the fire of the bombers. The infantry groups infiltrated to the river bank. The rubber boats of the assault troops were brought up by motors under cover to within a few yards of the river. As the infantry approached the water's edge, enemy machine guns opened from a bunker across the river. The Germans brought medium tanks up and silenced these machine guns. The rubber boats gained a footing on the enemy bank. Three companies with their heavy weapons gradually crossed and established a bridgehead. This required three hours. The battalion then dug itself in. The battalion held the bridgehead against counterattack for two days. During this time the engineers built a bridge. On the morning of the 15th, the enemy defense was broken by attack of tanks.

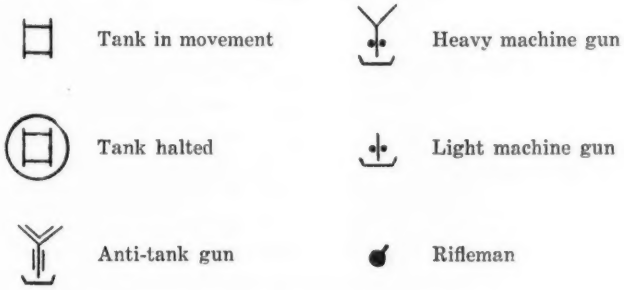
Armored Artillery.—This artillery is 105-mm gun howitzer type, some of which is armor-shielded and on self-propelled mounts. The remainder is towed by tracked personnel carriers which you have often seen. The armor-shielded artillery is often attached to armored infantry or tank battalions for combat. For example, the 4th Battery Artillery Regiment, No. 4, (105-mm gun how.) was attached to a battalion of the armored infantry regiment during the combat near Jolimetz. The battle order attaching and giving the mission of the battery is interesting. It was as follows: "The 4th Battery is attached at once to the 2nd Battalion Schützen Regiment No.____which will hold the west edge of Mormal Forest. Mission of the battery direct fire against enemy tanks."

Reconnaissance Battalions.—This unit is a complex of motorcycles, armored cars, tanks, motorized infantry, machine guns, antitank guns, 75-mm howitzers, engineers and signal troops. The important point to remember is that it fights for information in powerful detachments of the combined arms. The German armored reconnaissance is not a separate phase preparatory to combat. Its information is immediately exploited by the remainder of the advancing division.

—o—

It will be seen, therefore, that German military success is attributable to the German reliance upon a few sound principles of organization and tactics. Those principles emphasize teamwork, elasticity, prompt initiative even on the part of small units, and, above all, offensive action. Such qualities are the key to victory in this modern age of warfare.

Key to Sketches



(See page 28)

Current Trends in Use of Engineers in Combat

Adapted from Conferences Given at the Command and General Staff School

By

Captain Walter K. Wilson, Jr., *Corps of Engineers*

Every account that gives comprehensive coverage to any of the German campaigns of World War II places great emphasis on the use of engineers as one of the major factors making possible their blitzkrieg. While it was realized prior to World War II that increased mechanization and motorization would increase the importance of the engineer tasks in maintenance of routes of communications, the Germans surprised the world in the use they made of their engineers in actual combat. By this term "in combat" I mean the occasions in which the engineer soldier himself is in, or is exposed to, intimate contact with the hostile force—not just those occasions when his division is in combat. Our own tentative Field Service Regulations FM 100-5 has been recently modernized and now indicates in some detail the conditions under which an engineer organization may expect to engage in actual combat. These may be listed in general as follows:

1. As an emergency reserve.
2. In combat incidental to barrier tactics, demolition of, and clearing and maintenance of routes.
3. In an attack of a fortified position.
4. In forcing a river crossing.

Let us discuss our subject under these headings.

Examination of the European, and particularly the German, use of engineers in the light of our own expressed doctrine in FM 100-5 brings out definite trends in the use of engineers in combat which we should examine critically in order to determine how our own doctrine applies or should be extended.

The Military Engineer.

French Fortifications Reduced by Assault

As a background, let me emphasize the German viewpoint. The Germans invariably preface any discussion as to the general mission of engineer troops by the statement that above all, the engineer soldier is a combat soldier. This frame of mind goes so far as to cause the Germans to reject the very term "Engineer' which they believe accentuates the technical, and to use instead the term "Pioneer," which they believe properly emphasizes the combative.

As an Emergency Reserve.—To date, we have no account of a German division reaching their last resort and therefore would not expect to find them using their engineers as an emergency reserve. However, current German military publications still list such emergency use of engineers and under similar conditions to those listed in FM 100-5. These can be summed up in the statement that the engineers will be so busy carrying out their normal engineer functions of barrier construction and maintenance of routes of communication vital to the command as a whole that the division commander will not use them as a reserve until they are his last resort. Hence we can deduce that no immediate change is in store on this item.

In Combat Incidental to Barrier Tactics, Demolition of and Clearing and Maintenance of Routes of Communication.—This general subject can well be broken up into its various parts for discussion. Let us consider first barrier tactics, with its component parts of demolition and obstruction.

This field has received a tremendous impetus from the present war, with its increased use of mechanization and motorization. Here again, the Germans have not been called upon to stress their use of barriers and hence we have no information of their actual use of such barriers and the forces used to protect them. However, the current German doctrine, as still preached, whether or not it has been practiced, is to make extensive use of barriers and barrier detachments, utilizing for these barrier detachments the size and type force they consider proper in each case. They teach that it is a case of coordinating the obstacle-power of engineers with the firepower of the other elements of the detachment, indicating a tendency normally to use the engineers for constructing the barrier and not for defending it.

By studying the sins of omission on the French side, lessons of proper commission can be developed. The French had made no comprehensive barrier plans to limit a possible penetration, depending, apparently, on their main battle position stopping all penetrations. What plans they had were not comprehensive in scope and fell down in execution because of their extreme centralization of control, and the rapidity of the German movement. However, by studying the resulting actions and by consideration of subsequent French comment, we can arrive at certain logical conclu-

sions. But first, what should be the object of a barrier system? With a barrier system we are trying to:

1. Prevent surprise.
2. Protect the front flanks and rear of a unit.
3. Gain time for the movement of antitank guns and mechanized forces to meet the threat.
4. Canalize the movement of the hostile mechanized force.
5. Limit the freedom of movement of the hostile mechanized force.
6. With demolitions we try to interfere with the movement of both supply and combat vehicles, with obstructions, primarily the combat vehicles.

Obviously, one type solution will not accomplish all of the above. However, I believe several basic principles of a barrier system are apparent:

1. Some form of barrier system will be necessary in every type of action.
2. The effectiveness of natural and artificial barriers against enemy materiel must be common knowledge of all troops.
3. The barrier system will normally be extensive.
4. The barrier system must be continuously improved and extended.
5. Natural barriers must be utilized to the maximum and improved and connected by obstacles if necessary. Artificial barriers independent of any natural barrier will be the exception rather than the rule.
6. Economy of time and effort as well as resulting effectiveness will normally dictate the use of mines as artificial barriers.
7. Barriers must be covered by fire to develop their full effectiveness.
8. The ultimate objective is to build up the barrier system into a cellular system, so that breaching of one or several cells will not leave the hostile mechanized force freedom of movement.
9. It must be remembered that a barrier system alone cannot defeat a determined enemy; ultimate destruction of the hostile mechanized force can normally be accomplished only by fire or by positive action by our own mechanized forces.

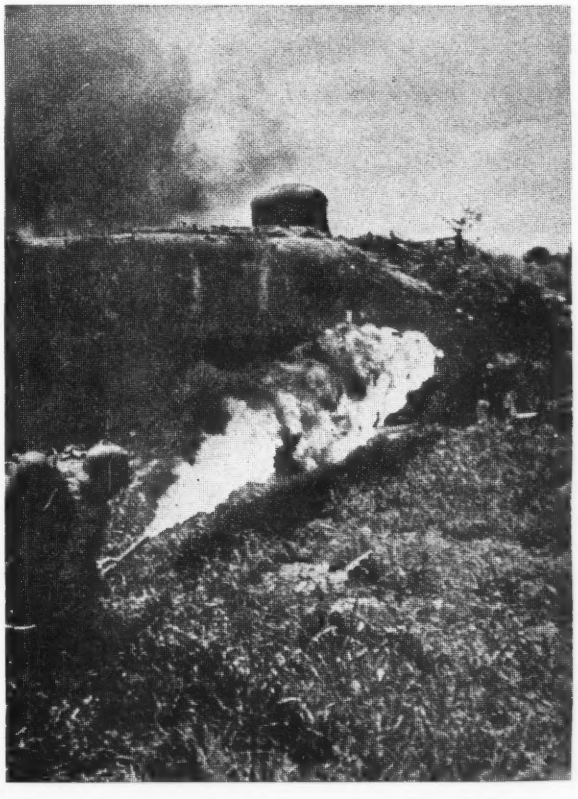
If, for our discussion, we accept these principles as stated, how does it affect the use of engineers in combat? Remember that if a commander follows these principles and those of FM 100-5, barriers will be used extensively and daily. Many of these barriers will be at some distance from the main body. Engineers sent out to construct them will be forced to protect themselves during the construction of the barrier and may have to drive off small enemy forces in order to seize the best locality for the barrier. Also the engineers may be called on to protect the barriers, although in this case, the division commander must balance the need for spreading the engineers further for barrier construction, maintenance of routes, and other normal functions, against the desirability of avoiding detachments from the other arms for barrier protection. If the engineers are expected to protect the barriers and to have staying power against mechanized forces, they must have antitank weapons attached, they have none of their own. From the viewpoint of the "last resort" situation, perhaps the engineers at this time should be used to protect the barriers, freeing infantry units for the emergency.

Two dangers in the execution of a comprehensive barrier plan should be pointed out. These are:

1. Capture of a prepared demolition prior to its execution.
2. Too free use of "removable road blocks" through the barriers of our comprehensive system.

The first can be cured by executing the maximum number of demolitions at once, and cloaking the man at the site of a prepared demolition, no matter how low his rank, with authority, irrespective of any other orders he may have, to execute the demolition, if, in his opinion, it will otherwise fall into hostile hands. The second can only be cured by holding to a minimum the number of "removable road blocks" used consistent with our own plans. Remember there are not many "removable road blocks" that are satisfactory in moving situations to stop tracked vehicles. Perhaps the best is antitank mines spread on the road surface and covered with fire.

A discussion of the subject of obstructions would be incomplete without some reference to the methods of overcoming such obstructions. The Germans state that it will seldom be possible to cross mine fields and antitank obstacles without having destroyed them beforehand or without using extemporized means. They concentrate fire on the enemy in position behind the obstacle, reducing, if possible, the enemy weapons to silence. Then covered by smoke, the



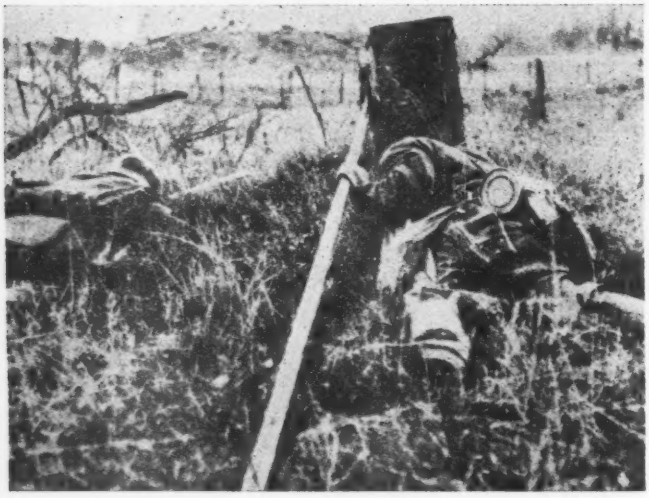
The Military Engineer.

GERMAN TROOPS USING A FLAME THROWER AGAINST FORTIFICATIONS

engineers create lanes. The Germans have developed several methods of destroying obstacles and mine fields as follows:

1. Artillery fire—only with a large expenditure of ammunition may leave craters which in themselves interfere with combat vehicles.
2. Aircraft bombs—same as artillery.
3. Upsetting obstacles by tanks.
4. Special Engineer means
   - A. Explosive charges on obstacles.
   - B. Prepared track bridges.
   - C. Pick up and destroy mines.
     - (1) Mine detector, magnetic.
     - (2) Prodding rods.
     - (3) Explosive net.

Our own Engineer School is developing similiar methods and technique. It is obvious that in most cases, the work must be done on the ground by engineer or other foot troops and that in order to insure their success, all available combat elements must protect them during the execution of the work.



ASSAULT ENGINEER WITH EXPLOSIVE ON POLE READY TO RUSH THE FIRING PORTS (PORT HOLES) UNDER COVER OF THE FLAME THROWER'S ATTACK

In consideration of the second half of this item—keeping open and clearing routes of communication—engineers will again be exposed to intimate contact with the enemy. Extensive use by the enemy of barrier tactics will require engineers with leading elements to clear routes, where they may have to cope with local defenders or with raids. Engineers with leading elements may find it necessary to defend an important installation which has been seized before the enemy could destroy it. Also engineer troops working on routes of communications well in the rear may be subjected to raids, leading elements of a breakthrough, or interference by hostile civilians. The Germans state that engineer tasks now are accomplished on the supposition that the work may at any moment be disturbed by armored car raiding detachments, even though the work is done behind friendly lines.

What trends can we determine from this for the use of engineers in combat? First, it is apparant that the engineers must be prepared for combat in the execution of any phase of this work. This indicates, I believe, a necessity for arming combat engineer units with some antitank weapons, and so organizing the squads, platoons and companies as to provide in each unit a work section and a security section. Second, the necessary extensiveness of barrier systems will necessitate the use of engineers primarily for construction of barriers and demolitions protecting the division as a whole leaving local sections to be developed by local troops; and using the engineers for protection of these barriers only in emergencies and for short periods of time.

In an Attack of a Fortified Position.— Our new Field Service Regulations assign to engineer troops forming part of an assault detachment the following missions:

1. Destroy mine fields.
2. Destroy wire entanglements.
3. Destroy tank traps.
4. Destroy other light obstacles.
5. Prepare crossings necessary for supporting weapons and armored vehicles.
6. If the emplacement is still intact, destroy it.

The FSR do not go into detail as to how the engineers will perform the first five of these missions but it is obvious that they can be considered as "engaged in combat" while in the performance of these missions. In regard to the last one, it goes into more detail showing the combat nature of this work but does not definitely assign it to the engineers. The Germans assign all these missions to their engineers and intensively train their divisional engineers to carry them out. They are given the blanket mission of silencing enemy fortifications and allowing the infantry to pass and eventually capture the crews. To do this, their engineers are trained in great detail to close with the fortification covered by artillery, smoke, and point-blank antiaircraft artillery fire and by the use of flame throwers and explosives, destroy the firing ports. However, in determining how this trend should influence our own engineer doctrine, we must remember that the Germans were training for a specific task at a definite locality. In my opinion, our army is not justified in training as large a proportion of troops in such detailed assault tactics. I believe a satisfactory solution would be the formation and training of one or two assault battalions under G.H.Q. composed of engineers, infantry or a combination of the two, giving them the mission of developing and perfecting methods and materiel for such an assault. Then, when an attack of fortifications of this nature can be foreseen, these battalions can either train additional battalions sent back from appropriate divisions, or they can themselves be attached to these divisions for the operation.

In Forcing a River Crossing.—This is a natural place to find engineers in combat. Our Field Service Regulations assign to the engineers the following missions:

1. Reconnaissance for initial crossings and for bridge sites.
2. Location close to the river of engineer troops and materiel.
3. Guiding of leading wave of infantry to the river.
4. Operation of assault boats and ferries.
5. Construction of rafts and bridges.

6. Guarding of bridges and regulation of traffic thereon.

Let us see where combat may enter into these missions. The reconnaissance may start before all hostile troops are forced back across the river. It must be extensive and must include actual movement to the bank. Engineer stream crossing materiel must be moved close to the river by the engineers and may have to be concealed and protected from raids, both ground and air, attempting to destroy it. Engineers meet the leading wave of infantry at the forward assembly areas, issue assault boats, lead the way to the water's edge, assist in paddling the assault boats across, bring the assault boats back for additional waves, and continue the ferrying by assault boats. After small arms fire is removed from the banks, engineers assemble and operate troop and vehicular ferries from ponton equipment. Normally, when artillery OPs capable of observing the banks have been captured, engineers start construction of the ponton bridges which are safe from artillery fire only after the bridgehead reaches the hostile artillery range. During this entire operation, the engineers may be called upon, not only to work at high speed under direct fire, but also, in emergencies, to seize more or hold what they have. The Germans modify this system by often using engineers as the assault troops to seize the far bank, by depending on speed rather than silence for success, using fast, motor driven assault boats; and by starting construction of the bridge as soon as small arms fire has been removed from the bridge site. I do not believe it is necessary to change our doctrine to replace infantry with engineers as the assault troops. Our Engineer Board is developing motor driven assault boats, which when issued in quantity, will enable us to revise our doctrine and abandon silence at the river bank or as soon thereafter as the crossing is discovered, and use high speed to get our leading wave across. And I believe as we acquire more ponton equipment, so as to have ample available at each site, we can afford to take more risks and will normally start sooner on construction of the bridges.

Conclusions.—From this brief glimpse of our own doctrine and of current European trends, I believe we can conclude that in general our tentative Field Service Regulations are up to date and will require only minor alterations in the near future. It is evident that combat engineer units must be prepared for actual combat as laid down in these regulations, and that to be effective in this use, they must be allowed by their division staffs ample opportunities to train for such use both by themselves and with the combined arms.

Wide World Photo.

GERMAN SOLDIERS PRACTICE THE TECHNIQUE OF LANDING OPERATIONS UNDER A PROTECTIVE SMOKE CLOUD IN THE DAWN'S HALF LIGHT

"Theoretical training is invaluable, as in any profession, but, as in most others, it forms merely the groundwork, as no two military situations are ever exactly alike. The necessity of professional education should not be minimized in the slightest degree; it is too highly important; but the best informed theoretical soldier without practical comprehension will often find his plans go wrong. To complete the qualifications essential to the successful soldier, there must be added persistence, force, initiative, and personal leadership." General John J. Pershing in "My Experiences in the World War."

Armored Units on Roads to Victory

By

General Guderian, Noted German Armored Force Commander.

[This is a translation from the German of an article by Colonel General Guderian, German Army, regarded as a foremost authority on armored units. It appeared in *Die Strasse.*]

From the beginning of time, roads have had a stronger influence on land warfare than any other man-made object, and today, more than ever before, movement of large armies is dependent upon well-built roads. The necessity for them increases directly with the difficulties caused by the mountainous, marshy, sandy, or wooded terrain through which they pass. Bridges play a particularly important role in the construction of modern roads, since vehicle loads are steadily increasing.

Great statesmen and army commanders have attempted to solve the road problem, and even today we marvel at the roads of Napoleon I and of the Romans. Modern German highways, with their numerous refinements, are just as important from a military point of view.

Commanders of motorized and mechanized units are naturally most interested in our roads. It brings great satisfaction to march with such units through old Germany and to observe that high speeds can be maintained with a minimum number of accidents and without fatigue to men or rough treatment to material. We do not even have traffic problems resulting from movement of vehicles in counter or parallel directions. The advantages of German highways were realized during the march to Vienna, the movement into the Sudetenland, and the operations against Czechoslovakia, Poland, and the western powers.

Along with our main highways, the German road net is now so well laid out and so closely meshed that our tank movements have met with no difficulties. Gaps that still existed on routes in frontier areas were closed, as a rule, by efficient cooperation of the labor service and loyal border civilians. With their help, bridges were made strong and safe.

But across the boundary line the picture was materially changed. Anticipation of this led to the most fearful apprehensions, especially concerning the movement of armored units.

"In the West," some said, "you will of course get through with your tanks because there are good roads over there, but in the East you will be immobilized. Sandy roads, marshes, and Polish wooden bridges are insurmountable obstacles."

Well, we got through in all parts of Poland.

"Oh yes," said the others, "you had such good weather and such an inefficient adversary that naturally everything went smoothly. But in the West it will be different. You cannot get through the Eifel Mountains and the Ardennes Forest, or across the Meuse River, the Argonne Forest, or the Vosges Mountains."

These problems were also met successfully, however, and it is well worthwhile to take a glance at how they were solved.

Because of their military characteristics, German motor vehicles in general—and track-laying vehicles in particular—have ceased to be road-bound; they can be driven over any trail that resembles a road. Given fair weather and soil, they have notable cross-country ability. These things are true because of painstaking cooperation displayed over a period of many years by military, industrial, and motor experts.

We must not overlook the excellent training of our drivers and the exemplary work of our tank field maintenance units, workshop units, and service units behind the lines. All of these groups effected quick repairs and forestalled any lack of fuel and other vital supplies.

Finally, our tank units had at their disposal pioneers who, by repairing destroyed roads and bridges in record time, permitted execution of the shrewd plans of the High Command in spite of disagreeable technical difficulties.

Our adversaries, both in the East and in the West, demonstrated notable skill in demolitions. Let us take, for example, our penetration of the former Polish Corridor in the vicinity of Konitz and farther south near Schwetz-Graudenz. The Brahe River, deep and with marshy banks, runs north through the Corridor, and the forests on both sides of the river extend eastward to the Tucheler Heath.

Since it was foreseen that all bridges would be destroyed by the Poles when the attack started, we expected to encounter strongest resistance while advancing on the main roads, but we hoped that by a quick dash on an unfortified forest road we could capture a 16-ton wooden bridge recently built by the Poles. Accordingly, a Panzer division was sent out on this mission. Its leading tanks succeeded in taking the bridge from the defenders, who had not anticipated the appearance of strong forces. Although the bridge was burning, we were able to extinguish the fire.

Two divisions advanced day and night across the bridge and the miserable sandy road on the far side to cut off the Corridor and to annihilate the Polish troops entrapped in it. In view of the offensive spirit animating troops and the traffic jams threatened by increasing depth of vehicle ruts, it is no wonder that many commanders shouted themselves hoarse attempting to maintain order in this situation. But they did.

A few days afterwards we dashed through East Prussia on good German roads and fought for the demolished Narew crossing at Wizna between Lomsha and Ossowiec. After we had passed the German border, there were no tar-surfaced roads, and we encountered horrible dust. Moreover, all bridges were demolished and the sand was knee-deep on the approaches to the crossing. Three divisions crossed the river here in column within 48 hours. Marching in three columns abreast and mostly over miserable sandy roads, we

continued south to Brest-Litovsk, where captured Polish officers asked whether we were parachutists. They could not understand how we had advanced so rapidly.

In the West, operations began with removal of road barricades which had been erected just across the German border. These barricades were reinforced concrete walls taller than a man, and beyond them lay shell craters so deep that any attempt to fill them up proved hopeless. Detours had to be built. Several delays caused by hostile resistance were promptly reduced by the action of our tanks and by night marches.

After we reached the Meuse at Sedan, demolitions became fewer and smaller. Probably our appearance had not been expected so soon, for it was possible to move much faster on the good French roads than in Poland. By May 20 we had taken Amiens and Abbeville; on May 25 we were in Boulogne, and on May 26 we had reached Calais.

From the Channel ports we moved back to the Aisne for new tasks which took us by the way of Chalons-sur-Marne, Langres, and Besancon to the Swiss border at Pontarlier, Belfort, and Epinal, and finally into the Vosges Mountains. At the beginning of this offensive we were confronted with the difficulties involved in crossing the Aisne River and the Aisne Canal. In the early part of this operation, much loss of time resulted from the fact that infantry and tank units used simultaneously not only the roads, but the few bridges that could be constructed in the face of hostile fire.

In accordance with General Weygand's instructions, all villages had been fortified and all roads had been blocked by barricades; thus heavy fighting and additional loss of time were necessary. We made up for delays by speeding over good roads after crossing the old Champagne battlefields.

On the evening of June 9 our tank units began to move; on June 17 we had reached the Swiss border, and on June 18, we were in Belfort and Epinal. This movement was completed in spite of the fact that the French had persistently and rather senselessly destroyed nearly all bridges up to the Swiss border.

We may get an idea of the work of our pioneers if we consider that within one command they built:

In Poland:

9 military bridges with a total length of 765 meters
99 temporary bridges with a total length of 2,436 meters

In the West:

33 military bridges with a total length of 1,272 meters
67 temporary bridges with a total length of *1,452* meters

208 bridges with a total length of 5,925 meters

Of these 208 bridges, 135 had a carrying capacity of 16 tons or more.

We conclude from this brief sketch of a part of the formidable operations in Poland and on the Western Front that roads to victory were by no means smooth highways. Despite serious handicaps, we often had to advance and fight on side roads and across open country. This fact delayed us a little, but it never stopped us.

"The commander of a pursuit must be imbued with a resistless will to destroy, and this must be felt down to the last man. Without regard for their neighbors, or for their communications, everybody and everything must push on after the fleeing foe. The artillery and heavy infantry weapons will pursue him with their severest fire as far as their ranges will permit, after which they too will follow on. The infantry, with its lighter weapons, will keep in contact with the enemy, and must never let him go. Darkness and difficulties of the terrain must not be allowed to check the pressure of the pursuit for a moment. Reserves will be thrown in where progress seems to be the greatest, or where it begins to make itself felt.

"The power of an energetic pursuit, carried on with the especially adapted motorized and armored forces of land and air arms, will make additionally difficult the decision to abandon the field. A decision to break off the battle, unless it has been carefully and systematically prepared, today can much more easily lead to disaster than in the past. For this reason, the attempt to detach the forces from the fighting front will only be made if there are sure prospects of better conditions for later fighting, if a success of one's own, or other especially favorable circumstances—such as the conformation of the terrain, or the approach of darkness—favor a breaking off, and if there is sufficient time for preparation. In such a case, aided by effective fire and a possibility of blocking the enemy, it may be possible to effect a withdrawal."—*Herman Foertsch*, Colonel of the German General Staff, in the *ART OF MODERN WARFARE*

World War II

By

Colonel Frederick M. Barrows, *Field Artillery*

When the last *Military Review* went to press early in March, the British, after turning tables on the Italians, in a well planned surprise offensive which started the middle of December, had driven the Italians out of Egypt, back on their line of communications some six hundred miles. This British offensive ended after the capture of El Agheila, near the middle of February. The reason for its abrupt ending was, as stated in the March *Review*, "due no doubt to her extended line of communications and the necessity of strengthening it, to the greater need of much of the Egyptian R.A.F. to aid Greece, and the possible use in Greece of some of the Libyan and Egyptian land forces."

The Greco-Albanian war early in March was at a standstill, due to severe weather conditions, neither side being able to make any perceptible gains.

About that time, the German shadow began to fall across the Balkan military scene. Bulgaria had joined the axis early in March, and Nazi forces were concentrated in large numbers in Bulgaria all along the Greek border, only 60 miles from Salonika and about 100 miles from the Dardanelles; the Nazis were also along the border of Yugoslavia, which had not allowed Nazi forces within her territory. The Balkan situation was ominous for the Allies.

In East Africa, however, things looked brighter for the British. As stated in the last *Review*, "the campaign in the East has all appearance of success and Italy's empire in that part of Africa seems rapidly to be folding up."

As for the Battle of Britain, Germany was intensifying her U-boat campaign and continuing her bombing of England. The British, however, remained undaunted, and were still in command of the sea, and were bombing Axis coastal towns and industrial centers.

Such, briefly, was the picture three months ago, and brief it should be for there is much to tell of events since that time.

Late in March, three important events took place—the last two somewhat brightening the situation for the Allies—namely, the signing by Yugoslavia of a pact with the Axis; the coup d'etat at Belgrade nullifying it; and the British defeat of the Italian ships in the Ionian Sea.

Generally speaking, since last summer the British position had gradually picked up a bit. The Luftwaffe were not doing what Der Fuehrer had expected of them. The United States was giving ever-increasing aid. There had been British victories in North Africa, in East Africa, in the Ionian Sea, and Allied victories over Italy in the Balkans. All these together with the coup d'état in Yugoslavia and Japan's ardor dampening somewhat (and this at the time of Matsuoka's visit to her Axis partners) gave a false feeling that Hitler's Near East thrust might be delayed even though he had sent a considerable force into the Balkans.

It must be remembered, however, that during the winter months Hitler had prepared for the "year of decision," for "the great battle that might decide the fate of the Balkans and North Africa, the Near East, Egypt and the Suez, the battle that might strike the mortal blow at the British Empire," as the New York *Times* put it.

In addition to the mammoth physical preparation that was going on within and without Germany for this gigantic task, Hitler sent his fifth columnists into the Balkans, put on pressure for increased trade with Germany, and increased his propaganda in that direction.

As April came in, the stage was quickly being set for another Blitzkrieg, with Nazi armored and motorized divisions continuing to pour into the Balkans and lining up along the Greek and Yugoslavian frontiers waiting for the word from Der Fuehrer. England, because of fear of losing what prestige she had left in the Balkans, was transporting from Egypt to Greece troops badly needed in Egypt for her defense of the Suez against the new Axis advance eastward from the base at Tripoli.

Why did Hitler wish to control the Balkans? Four reasons are apparent: the necessity for bringing Mussolini back into the picture; control of vital raw materials, such as oil and wheat; opening up the route to the Suez Canal and the Near East; and the bolstering up of Nazi prestige in the Orient.

The barriers to the oilfields in Asia Minor were Yugoslavia, Greece and Turkey, with the growing aid of England, so Hitler naturally realized that there was no time to lose as British aid was daily pouring into Greece and a British base at Germany's back door was certainly not to be desired.

Of course, Germany, after launching her attack, had to be reasonably sure that Russia would not interfere, and to be on the safe side placed at least seventy divisions in East Prussia, Poland and Rumania along the Soviet border. Turkey was powerless to come to the Allies' aid even if she had wished. With part of Turkey's army in Greece, Germany could easily have cut it off and defeated it in detail. Turkey would have been very foolish to have risked it.

The Balkan Debacle

Der Fuehrer struck early Sunday morning, 6 April. The same strategy and tactics used in Poland and Western Europe were employed again. The Allies knew what was coming after the dress rehearsal in Poland and the opening

performance in Western Europe. The mammoth production was merely reenacted in another theater. First came the airplanes attacking cities, railway communications, roads, enemy air fields, and airdromes, and the dropping of parachutists, their object being to paralyze the Allied air services and communications and to affect adversely the civilian morale. Then came the penetration into Yugoslavia and Greece by the German mechanized divisions, opening out as would a hand after entering the hostile lines.

The maneuver was a simple one for troops trained in war as were those of the Axis, a holding attack all along the upper Yugoslavia border, against an inferior and politically divided country, with the main attack west through the mountains of Southwest Bulgaria into the Vardar Valley. This drive continued in two directions, south to secure Salonika and west to separate completely Greece and Yugoslavia and to make contact with the Italian Army in Albania. These objectives being attained, the main attack turned south for the destruction of the Greek and British Armies.

Secondary attacks paralleled the main attack on the north to effect the complete destruction of the Yugoslavian Army. Others stretching south from Bulgaria overran Thrace in Eastern Greece.

The Battle in Detail

At dawn, 6 April, the German forces crossed the Greco-Bulgar frontier with the Metaxas Line, the Maginot Line of Greece, manned by three divisions.

The German blitzkrieg crossed the Greek border at five points: (1) Southward down the Valley of the Struma to Rupel Pass; (2) the Nevrokop plateau; (3) toward Drama; (5) south toward Komotine; (5) down the Maritza Valley. The Grecian territory east of the Struma was not intended to be held by the Greeks as any force there could easily be

cut off and defeated in detail, so the Germans reached the sea in that area without serious opposition.

The Allied plan was to defend with Empire forces west of the Vardar Valley, with the Greeks at the same time delaying on the Metaxas line and, if necessary, then for both Allies to withdraw to a line south of Salonika. It was expected that there would be an opportunity for an orderly withdrawal.

At the same time the Germans invaded Greece they invaded Yugoslavia, only partially mobilized.

The Yugoslav forces were disposed more from political considerations than military and the southern part so strategically important was not sufficiently defended.

Because of this improper disposition of Yugoslav forces the Germans were able to advance rapidly up the Strumitza Valley, thence on both sides of Doiran Lake and then on down the Vardar Valley, reaching Salonika the evening of 8 April, thus cutting off three Greek divisions.

There was a more serious aspect to this rapid advance in Yugoslavia. The mechanized forces reached Skoplje and Veles 8 April, thereby threatening the Monastir Pass.

To give an idea of the seriousness of this threat, it must be remembered that the greater part of the Grecian Army was in Albania about thirty miles from the Grecian border, its right flank being on the Yugoslav frontier and the left on the sea. The Imperial forces, together with two Greek divisions, under General Wilson had taken up a good natural defensive line from Katerini through Veria and Edessa thence to the Yugoslav frontier.

British armored forces north of this line were busy with demolition work.

It can be seen that a practically undefended area between these two defensive lines, the one in Albania and the other in Greece, was left open. This area was a mountainous barrier pierced by the Monastir Pass which was held by an insignificant Greek force.

When nightfall came on 7 April it was apparent that the Yugoslav army could not hold the Germans and the threat of mechanized forces through Monastir Pass became quite evident, so a force consisting of about a reinforced brigade with artillery and antitank weapons was sent to stop the gap at Monastir Pass. This reinforcement arrived none too soon for on 9 April the Germans reached the vicinity of Florina. Although the Imperial forces caused much damage to the enemy it became apparent that they could not hold on indefinitely against overwhelming enemy mechanized forces. Therefore on 11 April the forces of the Empire and those of Greece withdrew to a new line running from the Aegean Sea generally westward through Mount Olympus. (See map.)

Unable to hold this line due to the German pressure, with the main Greek army facing the Italians across the Pindus Mountains to the west, and faced with the danger of being outflanked from the west, the Allies found it necessary to withdraw to Thermopylae on a line south of Lamia. This withdrawal was accomplished by covering positions at Kalabaka and Tirnavos and the new position was occupied 20 April, it being held almost entirely by Empire forces as the Greek divisions, due to their valiant fighting, were very much depleted.

It was now evident that the Greek army in Albania could continue the struggle no longer since it was practically surrounded by Italian and German armies; and so, on 21 April, the Greek Government requested that the Imperial forces be withdrawn from Greece.

A New Zealand Brigade from a position on the pass south of Erythrai covered the withdrawal of the remainder of the Imperial forces to embarkation areas in Attica, Argolis and the Peloponnese.

While little is yet known of the evacuation of the Imperial forces it might be well here to quote Winston Churchill: "Up to the time when evacuation was seen to be inevitable, we landed about 60,000 men in Greece, including one Australian and one New Zealand division. Of these 45,000 have been evacuated."

Results:

According to Hitler, Germany lost about 4,000 in killed, wounded and missing. He claimed almost 550,000 prisoners; Serbian, 320,000; Greek, 218,000; British Empire, 9,000. While these figures are undoubtedly minimized or exaggerated as the case may be, to suit Nazi propaganda, still they are quite similar, in the matter of ratio, to the figures of other Nazi blitzkriegs.

With the collapse of Yugoslavia, and King Peter's flight, Hitler became master of another 95,000 square miles of territory with a population of 16,000,000. (Italy, it is reported, does have nominal control of most of the Dalmatian coast.) He likewise controls over 50,000 square miles of Greek territory, with its population of over 7,000,000. Presumably Greece will have, for the time being, about the same status as that of occupied France, with King George now in Egypt after having recently fled from Crete where he was head of the government of "Free Greece."

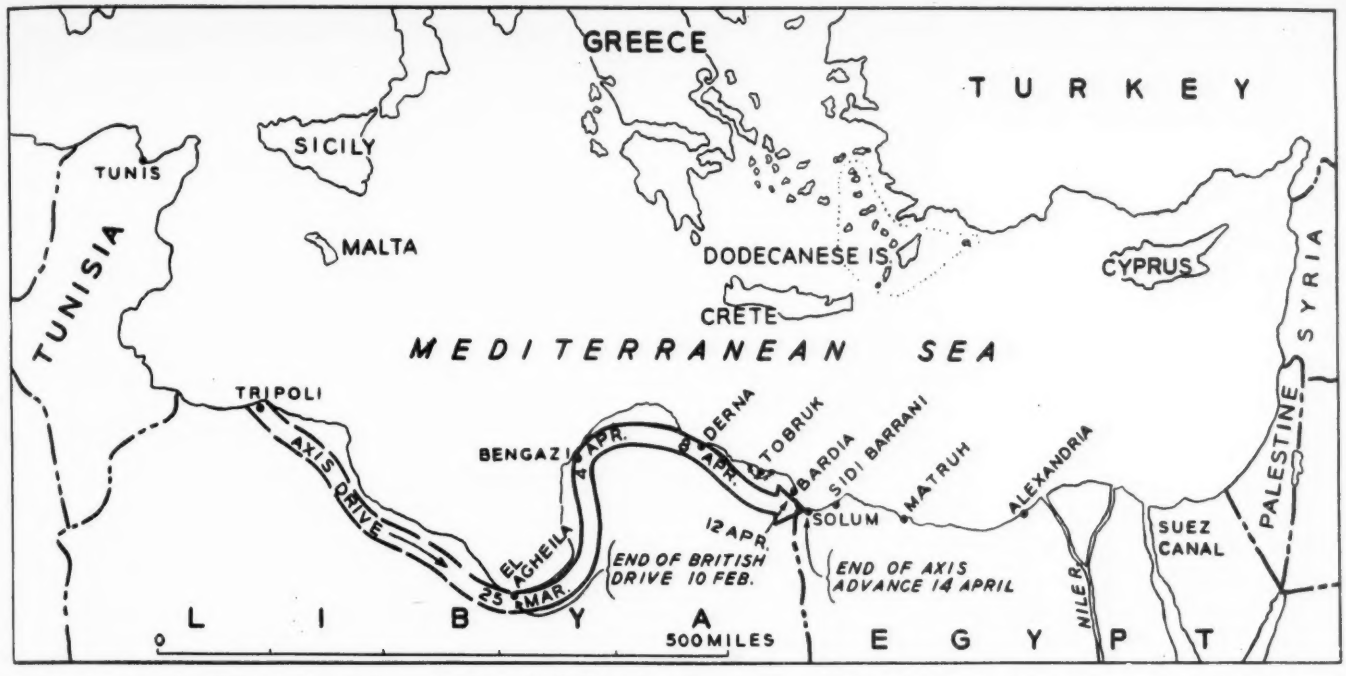
The Libyan Campaign

As stated in the March issue of the *Review*, "the Libyan campaign came practically to a standstill around the middle of February."

On 25 March, Germany, uneasy over Mussolini's plight in Egypt and undoubtedly fearful of internal troubles in Italy, began, after sending to Africa armored forces and air power, an offensive with the capture of El Agheila and eastward marched the battle lines. No authentic statement as to the size of the German force is yet known and it has been given as high as 100,000.

Her back stiffened by the armored ramrod from Germany, the Axis force in Libya continued its advance eastward and on 4 April the British evacuated Bengasi. General Rommel, the Panzer expert, was, so it is stated, now in command of this eastward drive.

The Axis offensive, except for direction and dates, reads almost like that of the British of a short while before. Derna, important for its deep harbor and as a supply base, fell on 8 April. On went the relentless Axis drive toward Tobruk, 100 miles from the Egyptian border, and about 9 April several thousand troops and four generals fell into Axis hands. Quickly did the British hurry up reinforcements to Tobruk, the R.A.F. pounding at the Axis line of communications.



Unable to take Tobruk the Axis pushed on, took Bardia 12 April and two days later Solum. Since that time the Germans have endeavored time and again to wrest Tobruk from the British but without success.

The Axis mechanized and motorized forces have been unable to advance farther east than Solum which at latest accounts has been recaptured from the Axis, the fighting in this locality being very intensive.

The British Mediterranean fleet, though it did let the German armored forces slip over to Africa from Sicily, has, in the retreat and stand at Solum, been of continued help to the British as it was in the advance. On 15 April, with the loss of but one destroyer, it sank eight Italian vessels—three destroyers, two transports and three freighters loaded with tanks, trucks and ammunition on their way to Tripoli from Sicily to reinforce the Axis Libyan army. The British navy and the R.A.F. have assaulted docks, supply depots and ships in Tripoli's harbor and concentrations around Tobruk and Solum.

Just why the Axis offensive has come to a halt is not known. Perhaps it is due to the "Khamsin," a dry, hot southerly wind, occurring during the fifty days following Easter and usually blowing from three days to a week and often accompanied by an outbreak of disease. Perhaps the returned expeditionary force from Greece and British forces no longer needed in East Africa have turned the trick. Perhaps it was halted until the completion of the Cretan affair and the consolidation of that island by the Axis. At any rate the offensive has adjourned sine die.

East Africa

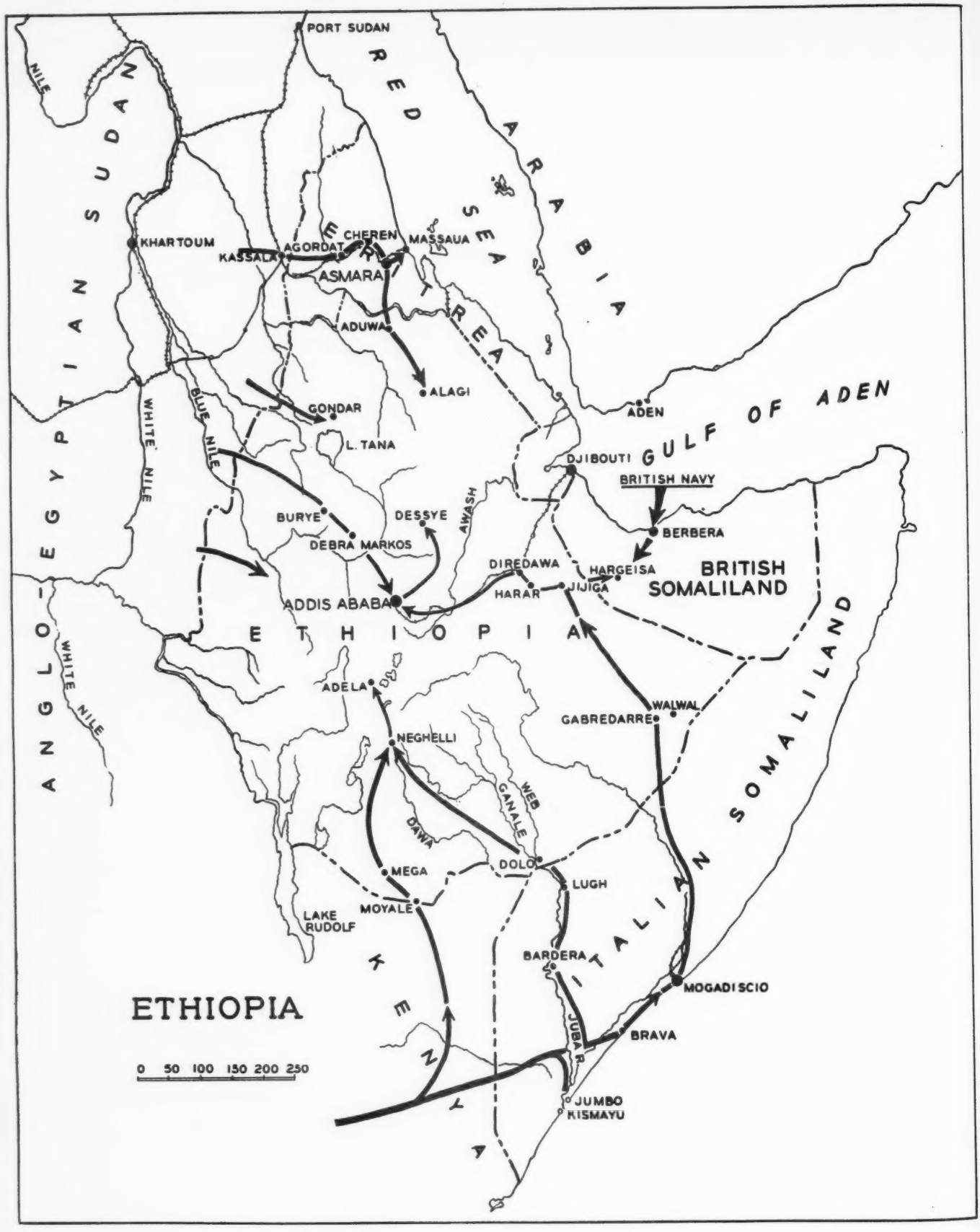
When the March *Review* went to press the situation was as stated: "The campaign in East Africa has all the appearance of success and Italy's empire in that part of Africa seems rapidly to be folding up." From all directions, except from British Somaliland, the Allied forces were rapidly closing in on Addis Ababa; Haile Selassie and British forces from the west, British and Free French from the north, and British forces from the south and southeast. By the middle of March, the British advancing from Italian Somaliland, which they had previously captured, had driven the Italians northward to Harar and Jijiga where they were protecting the Addis Ababa railroad. Shortly after this, British warships in a surprise attack occupied Berbera, the capital of British Somaliland captured by the Italians last August. With British Somaliland again in British hands, the threat to her columns facing the Italians before Harar and Jijiga was removed. Shortly thereafter the Fascist navy in the Red Sea met its doom, five destroyers being sunk off the Eritrean shores, three by the British Navy and two to prevent capture.

As March was drawing to an end, the closing-in process was rapidly continuing with little opposition except at Cheren, in northern Eritrea, where some 40,000 Italians held the British at bay, finally capitulating the last of March with Harar and Jijiga folding up about the same time, thus leaving the Addis Ababa railroad in British hands, the Italians falling back on Addis Ababa.

With Italian communications cut, the British in control of the air, and the swiftly choking process still going on, Addis Ababa fell on 6 April, the Duke of Aosta, Viceroy, of Ethiopia and commander of the Italian forces still continuing to hold out to keep British troops from moving to North Africa where they were badly needed.

The mopping up process by the British Empire forces was not over until shortly after the middle of May when the Duke of Aosta, with the last Italian defenders, some 7,000, surrendered at Amba Alaji, about 250 miles north of Addis Ababa. This left but a few scattered bands of little consequence and Ethiopia to all intents and purposes in British hands.

In the light of what has just happened, it is interesting to note that this is the fourth invasion of Ethiopia in the last seventy-five years.


PORT SUDAN
RED SEA
ARABIA
NILE
ANGLO-EGYPTIAN SUDAN
KHARTOUM
KASSALA
AGORDAT
CHEREN
MASSAUA
ERITREA
ASMARA
ADUWA
ALAGI
GONDAR
L. TANA
BLUE NILE
WHITE NILE
ADEN
GULF OF ADEN
DJIBOUTI
BRITISH NAVY
BERBERA
BURYE
DESSYE
AWASH
DEBRA MARKOS
DIREDAWA
HARGEISA
BRITISH SOMALILAND
HARAR
JIJIGA
ADDIS ABABA
ETHIOPIA
ADELA
WALWAL
GABREDARRE
NEGHELLI
WEB
GANALE
DAWA
DOLO
MEGA
LUGH
MOYALE
LAKE RUDOLF
BARDERA
MOGADISCIO
ITALIAN SOMALILAND
JUBA R.
BRAVA
KENYA
JUMBO
KISMAYU
ETHIOPIA
0 50 100 150 200 250

In 1867, because British representatives were thrown into prison by the arrogant, cruel and despotic Emperor, Theodore, General Sir Robert Napier came down from the north into Ethiopia reaching the Emperor's stronghold at Magdala in three months. After a short seige, Madala fell. Theodore committed suicide, the prisoners were rescued and Ethiopia became a good boy again.

1893 came the second invasion. The Italians were colonizing Eritrea and there was some dispute about the boundary. After futile efforts at adjustment, the Italians invaded Ethiopia meeting with initial reverses, then being reinforced. Menelik, the Emperor of Ethiopia, was a powerful ruler, brilliant and right on the job. He lay in wait for the Italian army of about 13,000 and with a force of nearly 100,000 tribesmen ambushed the foreigners, killing nearly 8,000 and capturing some 3,000. Italy gave up the task and made peace with Menelik, but never forgot this humiliation.

With the running sore still in Italy's side, Mussolini, with imperialistic ideas, in 1935 invaded Ethiopia from Eritrea in the north and from Italian Somaliland. After considerable difficulty and Haile Selassie putting up stiff resistence with his tribesman against modern equipment, the Ethiopian Emperor finally found the task too difficult and Mussolini added some 400,000 square miles and about 10,000,000 souls to the Italian Empire.

The fourth invasion of Ethiopia has just now ended with the King of Kings back on his throne and Britain much in the nature of a protectorate. In addition, the British Empire has also added to her domain: Eritrea with nearly 50,000 square miles and around 400,000 inhabitants, and Italian Somaliland with almost 200,000 square miles and a population of over 1,000,000. Taking all in all, one might say that England has done right well for herself, adding territory five times larger than her little Isle and quasi-control over a nation eight times larger.

Defeated in Greece but losing no territory; pushed back again to the Egyptian border in North Africa, with King Fuad still in control of all of his country through Great Britain holding a predominant position there; with Ethiopia under her wing and Eritrea and Italian Somaliland now British; and lastly, British Somaliland recaptured; all this with her little isle being bombed until it would seem she could stand it no longer—such is Anglo-Saxon power, pluck, perspicacity and perseverance.

The Ionian Sea Disaster

During the last week in March, an Italian naval force of three battleships, eleven cruisers and fourteen destroyers, their objectives and destination unknown, were attacked by a British force of three battleships, one aircraft carrier, four cruisers and an undetermined number of destroyers. The pursuit lasted all day with British airplanes bombing the enemy ships and apparently crippling one battleship. Greek destroyers took up the chase.

Night came on with British star shells making it known the Italian force had evidently split, the remaining ones being attacked and destroyed so the report goes, the loss, even admitted by Rome, being three heavy cruisers and two destroyers. British and Greek loss in men and ships—nil. This humiliating catastrophe lowered the Italian naval morale even further than it was already.

Iraq and The Middle East

Before taking up the Iraq and Near East question, it is well to remember that about thirteen centuries ago Mohammed made his hegira from Medina to Mecca, which was the beginning of the Mohammedan religion now embracing some 200,000,000 souls. The Arab speaking peoples, the natural embodiment of Islam, are to be found in the lands bordering the southern shores of the Mediterranean from Gibraltar on to the Persian Gulf. The Axis now challenges Great Britain and wishes to establish this area as its sphere of influence, the corrolary being the ejection of Great Britain from the Mediterranean.

Dr. Fritz Grobba, Germany's "Lawrence of Arabia." who for several years past has built up considerable Nazi influence in Iraq, succeeded through Rashid Ali El-Gailani, early in April in staging a successful coup d'etat, the latter becoming Premier.

Why this Axis challenge for the Near East? Oil and the Suez—oil, to deny it to the British and use it themselves—the Suez, as a necessary procedure in the eventual ejection of the British fleet from the Mediterranean.

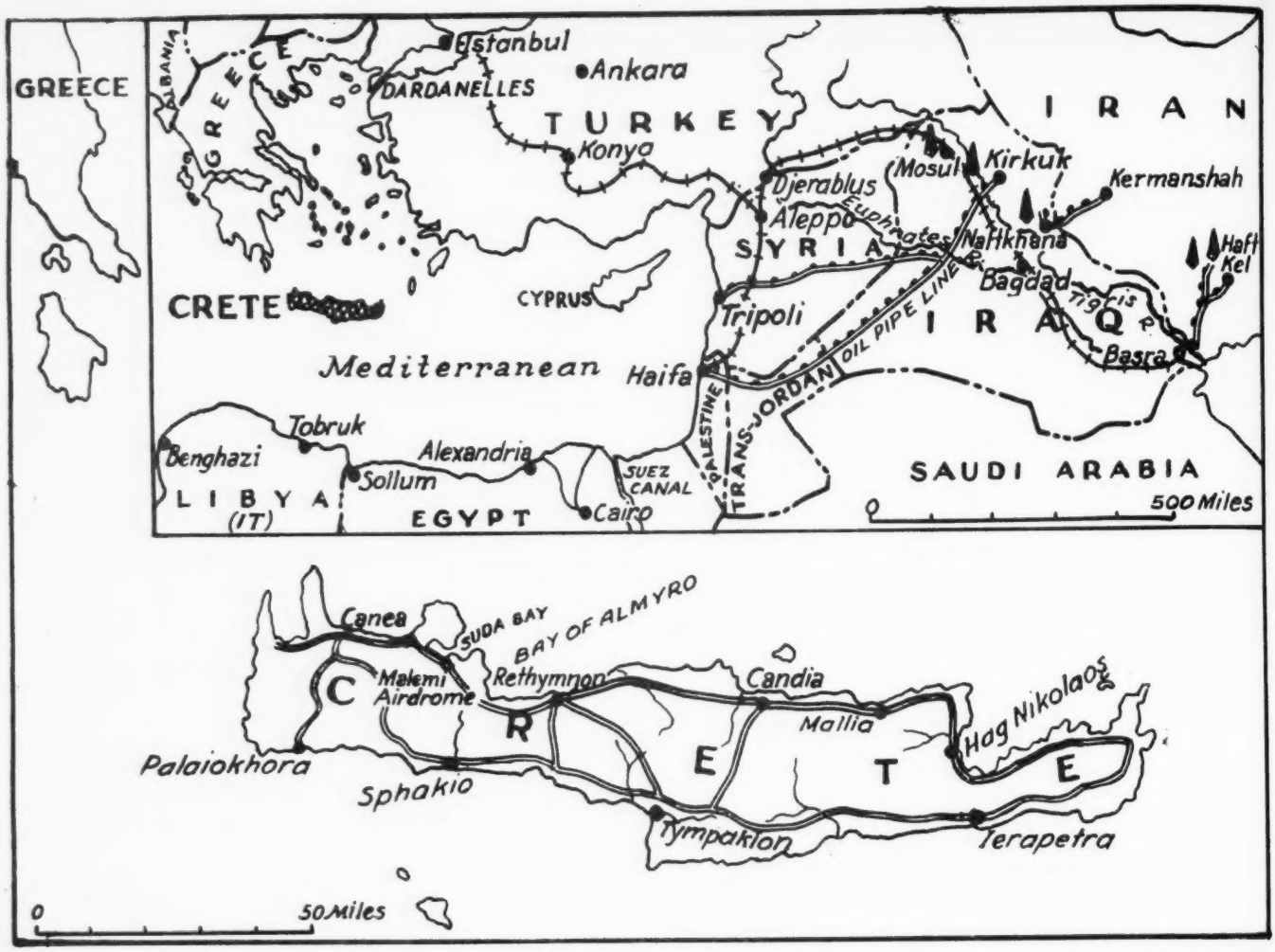
Now taking up the chain of events in the Iraq affair, on 19 April British forces landed at Basra on the Persian Gulf (under the terms of the Anglo-Iraq Treaty). On 2 May the British cantonments were fired upon—the fighting spread and it is reported Nazi help was sought.

It must be remembered that Germany was quite busy early in May consolidating her positions after the Balkan Debacle, making necessary planning for her march Near-eastward, occupying Grecian Islands off the Turkish coast to intimidate her perhaps, arranging with the Vichy government for the use of bases in Syria.

With German troops in Syria by the middle of May, and the R. A. F. bombing Syrian airports, the Near East struggle was well on its way. Soon England learned that Dr. Grobba was active in Syria inciting the people with Nationalistic ideas. The R. A. F. discovered French motor trucks with Arab volunteers bound from Syria to Iraq. At latest reports German and British forces were engaged both on land and in the air.

The most discouraging report from a British point of view is that Turkey is allowing trainload after trainload of arms and ammunition to be transported via her railroads. Of course it must be remembered, much as Turkey undoubtedly detests the Axis movement Near-eastwards, she knows what has happened before to resisting states and with the handwriting on the wall in bold letters, and Great Britain with her back against the wall and almost powerless to give her aid, she may be doing as Bulgaria and Rumania, taking the line of least resistance knowing what a spanking she would get should she do otherwise.

As May drew to a close, the British motorized forces moved west from the Mediterranean coast to aid at Habbanya, arrived in Baghdad, and it is reported that a committee in Baghdad, which took control of the Iraq government upon Rashid Ali El-Gailani's flight to neighboring Iran, has



signed an armistice with the British, and that the former regent, Emir Abdul Ilah, who left the country soon after Rashid Ali's cout d'état, has returned to Baghdad. However, this does not spell peace between the Germans and the British, and German planes are reported still in the Mosul oil fields in northern Iraq. Even more serious, for the British, Germans still occupy Syria and French-Axis "collaboration" in that sector appears to be increasing.

And this is the situation as June comes into being, not bright from an Allied viewpoint, with the chances of it becoming less so as time marches on.

Battle of Britain

As March came to an end, it was more and more evident that the Battle of Britain had expanded into the Battle of the Atlantic according to Winston Churchill. More intensive were the bombings of London, Portsmouth, Plymouth, Liverpool, and Glasgow. British sea losses became greater as a result of attacks by air, submarine and the German surface fleet containing at least two modern battleships. The R.A.F. early in April heavily bombed Berlin with the latter striking back at Coventry and Bristol and the following week with the heaviest bombing of London she had so far suffered. Revenge for the Berlin bombing, so the Nazis said.

Even should Britain's R.A.F equal that of the Axis, it must be remembered that the former is at a great disadvantage since England's jumping off bases for bombing of German centers are several hundred miles away while those of the Axis are but a stone's throw in comparison.

Due to the heavy Nazi air attacks of May, Westminster Abbey and the Houses of Parliament were badly damaged with retaliation by the R.A.F. on the Helgoland, Hamburg, Bremen, Mannheim and the coastal towns of France, Belgium and the Netherlands.

Germany well knows that to subdue Great Britain, England must fall and the staunch little isle is receiving a severe beating but comes up every time before the count of ten, the question being how many rounds can she last with almost none in her favor.

In this connection, since the war's beginning more than 6,000,000 tons of Allied and neutral shipping (over 1500 merchant ships) have gone down to Davy Jones' locker.

Hood and Bismarck

The Battle of the Atlantic reached the spectacular stage in late May with the British and German navies' engagement which took a toll of two of the world's largest battleships: the British battle cruiser *Hood,* 42,000 tons, of 1920 vintage

(more recently overhauled at a cost of about $30,000,000), and Germany's new man-of war, the *Bismarck*, 35,000 tons —each mounted with eight 15-inch guns.

The *Hood*, largest ship of the British Navy, went down off the shore of Iceland on the morning of 24 May, after a pitched battle in which the *Bismarck*, which left the port at Bergen, Norway, 21 May, more heavily armored than the *Hood*, drove a 15-inch shell through the armor sheathing at the side of a gun turret and into the *Hood's* principal ammunition chamber.

No sooner had the *Hood* started to sink than the other British ships in the pursuing fleet started firing on the fleeing *Bismarck* as she headed for port, some 1400 miles away. The Bismarck, though damaged, eluded the British on 25 May, but on the morning of 27 May, just three days after the *Hood* perished, the German battleship, spotted the day before by a Catalina plane which directed the British pursuers to her, went to the bottom after battle about 400 miles west of port at Brest, France. With her went her crew of some 1,300 officers and men, and her admiral, Guenther Luetjens. After being bombed by the torpedo planes of the British air arm, the *Bismarck* was subjected to shelling from heavy ships and finally torpedoed, which meant the loss of one-fourth of Hitler's known capital ship strength.

The Conquest of Crete

War for the possession of Crete is nothing new. It is as old as history. Down through the ages Crete has been successfully conquered, and in some cases reconquered, by the Phoenicians, Greeks, Egyptians, Romans, Mohammedans. The Crusaders, Venetians (by purchase), and the Turks. In addition to having been under so many flags, Crete has been the battle-ground for centuries of Christian and Mohammedan revolts and insurrections. This staunch little isle alone in the Mediterranean has ever been a tempting morsel for European greed, and now, because of a new arm of war, the air arm, it has become of vital importance strategically.

While the battle for Crete is but an aftermath of the Balkan debacle, it should be considered separately because it did not begin until after Greece and Yugoslavia had capitulated and the English had fled.

The Axis invasion began by a mighty bombardment from the air on the night of 19-20 May, the object being the destruction of Cretan airdromes, the crippling of the Royal Air Force, and the disabling of the antiaircraft defenses in order that the airfields at Candia, Rethymo, Malemi and Kisamo might be used by the Axis for landing air-borne troops. (See map.)

So, at dawn on 20 May, the Cretan sky above became filled with parachutists dropped from transport planes. These were soon followed by more parachutists in transport planes towing "aqua-gliders and land-skidders." Quickly much of the road along the northern coast was seized; also the Malemi airport, which is south of Canea.

When the parachutists had sufficiently established themselves, the air-borne infantry came along and with them machine-guns, mortars and light field guns.

Crete was defended by probably not more than 40,000 British, Territorials and Greeks; but in spite of the courageous defense by the Allies and the many casualties to the parachutists and air-borne troops in landing and afterward, the Axis had by the end of the third day gained footholds at key points of Candia, Rethymo and Canea.

The R. A. F., finding their airdromes either captured or about to be, and unable to compete with the overpowering enemy air force, withdrew to Egypt. The explanation upon deserting the isle, while quite true, no doubt, did not add to British prestige. In brief the reason being: "Experience in this war has already proved that it is impossible to develope satisfactory fighter defense from a few comparatively ill-equipped airports if these are subjected to high-scale enemy air attack."

Coming to the aid of the defenders of Crete has cost the British fleet dearly, its principal task having been to challenge the air invaders and prevent sea-borne expeditions from reaching the island. The British Navy in this defense has lost at least two cruisers and four destroyers, plus damage to two battle ships and other ships as well.

The Germans after a week or so began landing from the air small tanks, invaluable against an enemy without any.

The defense was inadequate, nor could the defenders be properly supplied, reinforced, or relieved when exhausted. German air superiority was never in doubt and spelled success for the air invaders who cleared the way for sea-borne troops.

When the German forces holding Malemi were augmented by new arrivals, the push eastward began, the Germans at the same time gaining control of Suda Bay and the Bay of Almyro, which made it clear that landing of additional troops could not be prevented. When, after the battle had gone on for a week or so, Italian forces landed at Mirabella Bay, (at the east end of Crete) occupying the eastern tip of the island, the typical Axis pincers movement was again under way. Accompanying all this was the bombing of ports along the southern coast to prevent the arrival of aid for the Allies and, soon, to impede evacuation.

On 25 May King George II of Greece escaped to Cario, where his moveable throne is temporarily located.

On 1 June Great Britain's War Office acknowledged the struggle over, stating some 15,000 British, Imperial and Greek Allies had been evacuated from Crete and were safe in Egypt, claiming these troops constituted more than half the defending forces. Casualties on both sides in men and matériel were proportionately great for the size of the forces engaged.

And so endeth the battle for Crete. The Allies had lost it before it was begun. They never had a chance. Germany in order to win would have sacrificed thousands upon thousands of German youth—for win she must.

Why was this little island, 160 miles long, so important to the Axis that they were willing, for almost any sacrifice, to gain it?

Air supremacy was necessary there. Now, since that is accomplished, Alexandria is less than 350 miles away, Suez less than 500 and, most astounding of all, Tobruk and the African coast but 200 miles distant. The Axis are now

in a position to use the pinchers on Suez, or, to make a drive for Cyprus and then the near-east oil fields. Perhaps she may try both. Turkey is powerless and there is little danger of her coming to the Allies' aid; in fact, it is reported that train load after train load of Nazi matériel and supplies are passing through Turkey on their way near-eastwards; and this may be so. Figuratively, the Mediterranean, known in poetry and song for her deep blue waters, has now, to the British eye, a black and tan appearance.

The Far East

By Colonel F. M. Barrows, *Field Artillery*

For many months the Sino-Japanese War has been a stalemate when one considers the actual fighting, with no indications that it will not continue indefinitely.

The most eventful happening during the last three months is the journey of Matsuoka, Japanese Foreign Minister, in mid-March to Moscow, Berlin and Rome, it having been announced just before Congress passed the Lease-Lend Bill. His stay in Europe was somewhat overshadowed by the coup d'état in Yugoslavia when the king was overthrown because of hostility to the agreement entered into by him with Hitler. This and the Ionian Sea battle, an Italian disaster, did not leave a very pleasant taste for Matsuoka at the banquets in Berlin and Rome. As we all know, however, Hitler's armored entry into Greece changed greatly the diplomatic outlook; so, when Matsuoka reached Moscow and signed the not-yet-quite-understood Soviet-Japanese Neutrality Pact, the Axis march of agression was well on its way near-eastwards.

This Russo-Japanese Pact, signed 13 April, provided as stated in the New York *Times*, (1) "that Japan and the U.S.S.R. should 'maintain peaceful and friendly relations between them;' (2) if either were attacked by a third power, the other should remain neutral; (3) in return for Russian recognition of the 'inviolability' of Japanese-dominated Manchukuo, Japan should recognize the 'inviolability of the neighboring Soviet-supported Mongolian Peoples' Republic."

This new Soviet-Japanese agreement would seem to bear out the statement in the March *Review*, and reports from London in early May, that, despite the Axis-Japanese Alliance of 1940, Japan has preserved "the right to decline to join the Axis in conflict should it suit her if the occasion arises."

While this new pact made no specific reference to the four-year-old undeclared war with China, it can be seen that Japan, because of her public utterances and the publication, about 1 May, of "exploratory" peace terms embodying both the "incident" in China and World War II, would like very much to clear up the "incident" in order to be ready should the occasion arise for a movement southward, diplomatic, military or both.

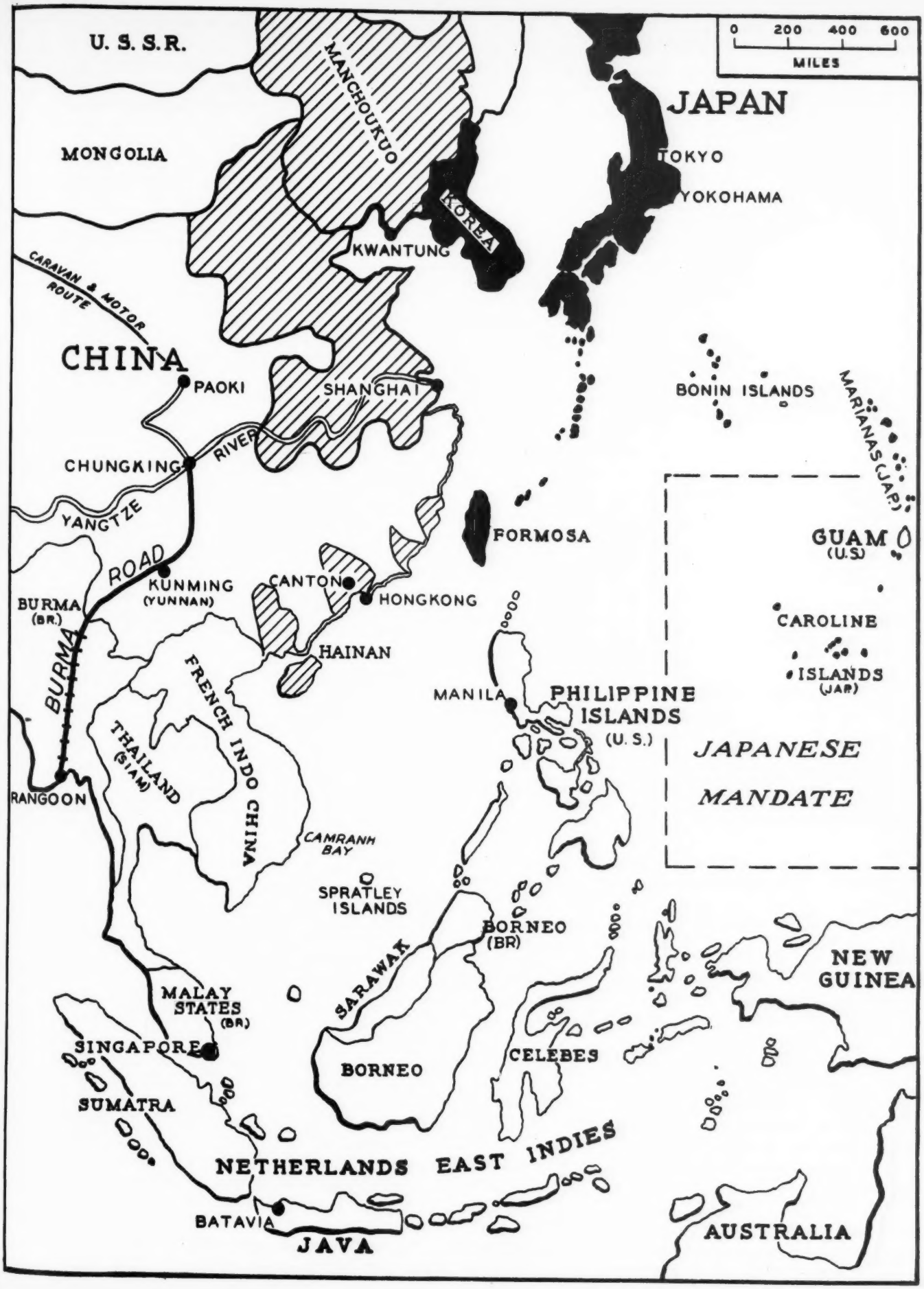
With the Thailand-Indo-China conflict settled to Japan's liking in the treaty of 9 May in which Japan has been termed the underwriter, Japan has such a strong economic hold on French Indo-China that she can now march southward with both Indo-China and Thailand furnishing her bases and economic aid whenever desired.

In April, Chiang-Kai-Shek's Chungking government was considerably strengthened. Dr. John E. Baker, long-time adviser and administrator in China, was designated as Director of the Burma Road, bearing with it the hope that shortly the theoretical capacity of the road (20,000 tons of freight a month) will soon be realized. China is still fighting on, her millions still unsubdued. Early in April Chiang Kai-Shek claimed the capture of Japanese outposts south of the Yangtze River and the destruction of some 20,000 Japanese troops.

On the other hand, despite the peace talk in Japan and the usual but more apparent conflict between the so-called "conservatives" and "military-fascist" elements, the Japanese Army early in May began a new offensive in Central China, which, by the middle of the month, had become a major campaign. Reports state the heaviest fighting has been in the region northeast of Paoki, with the Japanese trying to move south and west, together with other attacks against the Chinese along the western front in the region just north of the Yangtze. Counterattacks were made by the Chinese in the northern sector, resulting, according to Chiang Kai-Shek, with the capture of some territory by the Chinese.

Soviet Russia still continues to send military supplies to Chiang Kai-Shek in spite of the Soviet-Japanese Pact, and neither Soviet nor Japanese troops have been withdrawn from the Manchurian frontier.

And so as June comes in Japan finds herself much in the same position as she has been for several months. She knows, with England not defeated, what a dangerous venture will be an offensive either toward Singapore (recently reinforced) or the Netherlands East Indies. With her export and import trade with other-than-the-Axis powers cut off, should she attempt a southward move, with her relations with Russia never a known factor in spite of the treaty, she really can do no more than remain in *status quo* trusting for an Axis victory and a British Empire impotent in Asiatic waters.


U. S. S. R.
MANCHOUKUO
JAPAN
0 200 400 600
MILES
MONGOLIA
TOKYO
YOKOHAMA
KOREA
KWANTUNG
CARAVAN & MOTOR ROUTE
CHINA
PAOKI
SHANGHAI
BONIN ISLANDS
MARIANAS (JAP.)
CHUNGKING
RIVER
YANGTZE
FORMOSA
GUAM (U.S.)
ROAD
KUNMING (YUNNAN)
CANTON
HONGKONG
BURMA (BR.)
CAROLINE
ISLANDS (JAP.)
HAINAN
BURMA
FRENCH INDO CHINA
MANILA
PHILIPPINE ISLANDS (U. S.)
JAPANESE MANDATE
THAILAND (SIAM)
RANGOON
CAMRANH BAY
SPRATLEY ISLANDS
BORNEO (BR)
NEW GUINEA
SARAWAK
MALAY STATES (BR.)
SINGAPORE
BORNEO
CELEBES
SUMATRA
NETHERLANDS EAST INDIES
BATAVIA
JAVA
AUSTRALIA

The Breakthrough of the German 63d Infantry Across the Somme, 5-6 June 1940

[From an article in *Militärwissenschaftliche Rundschau*, November 1940. Translated from the German in the Translation Section, The Army War College, Washington, D. C.]

Reading of the following account of the 63d Infantry would seem to substantiate conclusions that the application of the principles of warfare has changed but little since World War I with respect to infantry tactics. Except for a few changes here and there one would think he were reading an account of an infantry regiment in the attack in 1918. In fact, the editor did look back to the first page to see that it was 1940 instead of 1918.—Editor.

In preparing to cross the Somme, the 63rd Infantry was shifted nearer the river on 3 June. For several days there had been thorough reconnaissance of the Somme sector on both sides of Picquigny. (See map at end of article.) The reinforced 1st Battalion relieved the security elements of another division along the Somme during the night of 3-4 June and moved into the sector as follows:

Right boundary: Road fork 400 meters east of la Chausée-Tirancourt—crossroads in the east part of Picquigny—east edge of Fourdrinoy.

Left boundary: Crossroads 1,400 meters southeast of St. Vast-on-Chausée — Ailly-sur-Somme (exclusive) — St. Christ-Ferme.

The battalion had orders to form so as to be able, besides securing the Somme sector, to cover and support later the attack of the 2d Battalion, on the right, and the 3d Battalion, on the left, astride the large pond 1,000 meters east of Picquigny. This support was to be furnished by the heavy weapons which were to take up positions at Tirancourt and Camp Romain and fire on hostile strong points on the high ground south of the Somme. In addition, the 13th Company (Regimental Infantry Cannon Company) placed a platoon of light infantry cannons in the ravine 400 meters west of Camp Romain and a platoon of heavy infantry cannons in the ravine north of Camp Romain for the same support mission.

Artillery designated for cooperation with the Regiment was displaced as follows: a battalion of light field artillery in the region 1,500 meters west of St. Vast-en-Chausée; a battalion of light field artillery in the depression south of St. Vast-en-Chaussée; and a battalion of heavy field artillery in positions approximately 800 meters north of St. Vast. The three battalions were combined into one artillery group.

The main body of the Regiment took up a position in readiness located farther to the rear: the 2d Battalion occupying the Bois Ducroquet, the 3d Battalion the woods southwest of Flesselles. Headquarters Company and Regimental Headquarters moved into the vicinity of the church at Flesselles; one-half of the 13th Company into the northern part of the woods west of Flesselles; 14th Company (Regimental Antitank Company) into the southern part of the woods west of Flesselles. The regimental trains likewise were advanced into those woods. The location of the regimental command post for the crossing was reconnoitered and prepared at the bluff just west of the letter "C" of the word "Camp Romain." The combat posts of the 1st Battalion and artillery group were established close by.

The fourth of June was spent in a detailed reconnaissance of the area and the preparation of the auxiliary material to be used in establishing a crossing. Trees were available in the deep ravine which extends from the region south of St. Vast southwestward. The artillery fire of approximately three light and one heavy hostile batteries, which had been concentrated on the ravine throughout the night, abated during the day. This permitted the auxiliary material for the crossing to be brought up and all other preparations to be made without interference. A company of engineers, attached to the Regiment, constructed two ferries, one for the crossing of the 2d Battalion west of the large lake one kilometer east of Picquigny, the other for the crossing of the 3d Battalion east of that lake; in addition, it prepared a foot bridge of kapok bags for the 3d Battalion.

During the night of 4-5 June, the assault elements of the reinforced Regiment moved into their reconnoitered positions in readiness on the north bank of the Somme. The boundary line between the 2d (right) and 3d Battalions (left) was designated as follows: Line of the creek running through the ravine north and west of Camp Romain—east edge of the pond one kilometer east of Picquigny—Hill 99. The piece of woods 1,200 meters south of Hill 74 (2d Battalion) and the south edge of the woods south of Hill 99 were fixed as the initial objective. Under the cover of that narrow bridgehead, a four-ton bridge was to be erected at Breilly for the artillery, combat vehicles and so forth. Elements of the 3d Battalion were to take Breilly from the rear. The idea of ferrying guns across the Somme, on both sides of the large lake, was dismissed, after reconnaissance parties pushed on across the river during the night and found the lowland along both river banks a solid large swamp. It was barely passable for infantry, though the men later waded up to their hips and neck in the swamp and had to use beams, planks and poles to make their way through the swamp. The high reeds covering the swamp permitted the infantry to cross the lowlands under cover, that is, to reach under cover the numerous machine gun nests which the enemy had strung out along the steep slope just south of the Picquigny

—Breilly road. It was clear that the decisive phase of the entire action consisted in the assault launched from the cover of the swamp against the steep slopes and machine-gun nests. The issue at stake depended upon the success of that assault. Therefore, every leader, including the Regimental Commander, had to be up front, where they could exercise their influence upon their men at the moment of the assault on the steep slopes.

In the attack orders, zero hour was set at 4:30 AM (dawn). All rifle companies of the two battalions were to attack frontally and with surprise effect. The artillery and heavy weapons had orders to open fire on observed targets at the same hour. In that connection, the heavy infantry cannon platoon had the mission of firing on Breilly and demoralizing the enemy located there.

The frontline battalions were reinforced by a light infantry cannon platoon and an antitank platoon each. These light infantry cannons and antitank guns were to be ferried across the river and moved up rapidly by way of two dry paths, one of which led in the direction of each battalion.

The remainder of the 13th (Regimental Infantry Cannon Company) and 14th (Regimental Antitank Company) Companies likewise had orders to follow across the river at the earliest possible moment. The 2d and 3d Battalions were reinforced by the necessary elements for antitank defense.

The attack went under way at 4:30 AM, as ordered. Aided by its many foot bridges and small inflated rubber boats, the infantry rushed across the Somme and pushed on through the swamp, heedless of the unbelievable difficulties in its path. The obstacles were greatest in the zone of the 3d Battalion. The danger was that, if that battalion did not succeed in carrying the assault forward from the swampy ground, the attack of the 2d Battalion, which in part was carried over firmer ground, also would come to a halt. With that in mind, the men of the 3d Battalion put forth every ounce of their strength; wading up to their chests in water, the Battalion Commander in front, elements of the Battalion pushed on through the swamp, broke through the line of hostile machine guns at a point near the solitary house located below the second "e" in the word "Compiegne," and established a foothold on the slope. According to the testimony given by prisoners later, the French believed it impossible for major forces to advance through the swamp.

At that juncture, the assault shortly met with its first crisis: A large number of well-concealed hostile machine guns and riflemen hidden in trees maintained a steady fire on the remainder of the 3d Battalion, as it moved up through the swamp, as well as on the command posts of the Battalion and Regiment located there. It was difficult to set up a machine gun in the swamp. However, a machine gun was mounted on a pile of reeds and a hostile machine gun nest put out of action at closest range. The only other fire permissible was rifle fire delivered from the standing position. The number of casualties grew alarmingly under the withering fire of the hostile machine guns. It was obvious that an assault launched simultaneously by all contingents was the only hope of success. Rushing forward, the Regimental Commander shouted loudly the orders to attack and had a bugler of the 3d Battalion sound the "Advance" call. Like one man, all jumped up, heedless of further losses. More and more men climbed to the top of the slope. Pushing ahead at a slow but steady pace, the troops carried the assault forward, despite flanking machine gun fire coming from the direction of Breilly and the west. A light infantry cannon, ferried across the river, went into open position on the road, destroying a hostile machine gun nest with its first round. Prisoners were hauled out of the machine gun nests. Most of the enemy kept firing to the last and died in place. A seriously wounded hostile machine gunner (probably Alsatian), who could speak a little German said: "You did a good job."

The advance of the 3d Battalion helped the 2d Battalion to gain ground, despite flanking fire coming from Picquigny and the Bois de Neuilly, where the regiment on the right had been unable to make any headway.

Elements of the 1st Battalion, which had used the more favorable crossing of the 2d Battalion, reported as regimental reserve to the regimental command post at the single house near the second letter "e" in "Compiegne."

It was 7:00 AM, when the 2d and 3d Battalions reached the initial objective, still fired upon by hostile machine guns that were holding out in their well-concealed positions in the dense woods, and suffering from enfilade machine gun fire delivered from the zones of the adjoining regiments which had been unable to gain any ground. The Regiment thereupon consolidated its position by moving up heavy weapons and securing additional artillery support in the newly established bridgehead. A company of the 1st Battalion was designated to seize Breilly and mop up that locality. Overcoming stubborn resistance, the company carried out its mission, though it was shown later that several hostile machine guns and riflemen hidden in trees had remained in Breilly, determined to keep fighting to the end.

Combat reconnaissance conducted by that company revealed that strong forces of the opponent and numerous machine guns were located in the zone assigned to the regiment on the left, that is, in the small woods 500 meters south of Breilly as well as among the group of farm buildings just north of the word "sur" of the name "Ailly-sur-Somme."

Upon receipt of a report to that effect, the Division Commander directed the Regiment to seize the woods and farm buildings. The execution of the mission fell to the 1st Battalion (less 1st Company) which had arrived meanwhile at a point west of the regimental command post and taken up a position in reserve.

While the 63d Infantry, itself, had gained several kilometers of ground on the far bank of the Somme and taken the most vital part of the high ground, the regiment on the west flank lagged behind at Picquigny; and that on the east flank was still at Ailly-sur-Somme. The 2d Battalion —in front and on the right—had gained the woods some 1,200 meters southwest of Point 74, and the 3d Battalion the clumps of woods south of Point 99.

The fighting up to that time had been difficult and costly. The opponent had offered stubborn resistance, especially in the woods and along rows of trees, and continued to fight long after the attacking troops had passed the strong points and pushed on beyond them. The plan of the Regiment was to continue the attack as soon as enough heavy weapons had moved up. That required the 1st Battalion to rejoin the Regiment at the earliest possible moment.

At 8:15 AM, new regimental orders were issued for the assumption of a position in readiness and continuation of the attack. Zero hour for the new attack was fixed at 2:30 PM, as directed meanwhile by Division Headquarters.

The regimental orders were worded as follows (extract):

Regimental Orders

for the Assumption of a Position of Readiness and Continuation of the attack

(1) Hostile machine guns are defending Romomt Ferme and St. Christ Ferme; while hostile artillery (estimated at three batteries) is firing from the region of Saisseval mainly on woods near Hill 99.

(2) The Regiment will take up a position in readiness for the continuation of the attack. The width of the regimental combat zone will be narrowed, with the 2d and 3d Battalions occupying the frontline as heretofore:

Right boundary: As at present;

Left boundary: Hill 99—Romomt Ferme (inclusive) — Saissemont (exclusive) — Saisseval (inclusive)—Seux (exclusive).

Boundary between 2d and 3d Battalions: Long depression east of Hill 74—small woods (400 meters north of Point 74, at Romomt Ferme)—bend in road 600 meters north of Saissemont—letter "e" in "Saisseval"—Chateau Seux.

(3) The attack will commence as follows:

(a) Independently, if the regiment on the right moves forward from the south edge of the Bois de Neuilly;

(b) Otherwise at my command.

In support of the attack, a battalion of light field artillery will be moved up into the depression east of Hill 74, and another battalion of light field artillery into the region just west of Breilly.

(4) One light infantry cannon platoon each will remain with the 2d and 3d Battalions. The remainder of the 13th Company (Regimental Infantry Cannon Company) will support the attack of the two battalions—with emphasis on the 3d Battalion—by destroying the enemy at Romomt Ferme and in the woods southwest of that point. This company will operate so that elements of it will be able to prevent a flank attack from the region of St. Christ Ferme and, in the course of the advance, guard against attacks from the clumps of woods east of Saissemont.

(5) The 14th Company (Regimental Antitank Company) will leave one platoon each with the 2d and 3d Battalions; while the other platoons will cover the outer flanks of the 2d and 3d Battalions against hostile tanks.

(6) The 1st Battalion, in regimental reserve, will remain at my disposal and, the moment the attack goes under way, move into the woods 500 meters north of Hill 99. The company now located at Breilly will join the Battalion as soon as the head of the adjoining regiment arrives.

(7) The Regimental Trains will cross the bridge at Breilly and move to the single house just south of the last letter "e" of the word "Compeigne."

(8) The regimental combat post will be shifted into the woods 500 meters north of Hill 99.

At the beginning of the attack, the 1st Company will be the only available company of the 1st Battalion (regimental reserve).

Shortly after the attack went under way (around 3:00 PM), observation from the regimental combat post—which had been advanced to the southwest corner of the woods southwest of Hill 99—revealed that, meanwhile, the 2d Battalion had taken advantage of the situation (having encountered but weak enemy in front) and pushed on to the hill east of Fourdrinoy. The neighbor on the right was still lagging behind, near the south edge of the Bois de Neuilly. In the meantime, the 3d Battalion had been busy mopping up hostile machine guns that had remained in the woods south of Hill 99: reorganized for the attack, it took up the advance now—a little late—with its left flank driving across Romomt Ferme. After overcoming some individual resistance, the Battalion gained the region at and southwest of Romomt Ferme, where it was in line with the 2d Battalion. The latter had been facing heavy machine gun fire and made but little headway. At 5:45 PM, the enemy, approximately a company strong, gave way before the right flank and withdrew to the village of Fourdrinoy, where he resumed his resistance.

The 1st Battalion, having penetrated the woods south of Breilly and rounded up some 50 prisoners, reported that it would be at the disposal of the Regiment in the woods west of Hill 99 at 7:00 PM, upon completion of its mission.

Meanwhile the 2d Battalion continued to hold its new line. It had no contact with its neighbor on the right, though the sound of battle was audible in the region of Picquigny and the Bois de Neuilly.

Two companies of the 3d Battalion, in conjunction with the 2d Battalion, likewise had established a defensive line.

Hostile artillery was still laying down heavy fire from the area Saissemont—Saisseval—Bovelles. After an air attack on this artillery, the 3d Battalion succeeded in pushing on to within about 400 meters of Saissemont. Flanking fire from the east blocked any further progress and compelled the companies to dig in. The 2d Battalion was unable to advance any farther.

In the woods south of Hill 99, hostile machine guns and individual riflemen opened fire again and again. This was due to the fact that the hostile machine gun nests were so cleverly concealed in the dense undergrowth of the woods and offered such stubborn resistance that it was necessary to take them one by one. Meanwhile the 1st Battalion was making its way through the depression south of Hill 74 to the small woods above the letter "y" in "Fourdrinoy" (500 meters northwest of Romomt Ferme), in order to place itself at the disposal of the Regiment. The regimental command post had been moved to a point 300 meters northeast of the crossroads (600 meters west of Hill 99). It was now dark.

Hostile orders found subsequently revealed that the French 13th Division, comprising the 60th and 21st Infantry, and the 8th Moroccan Rifles, and four battalions of light and

two of heavy field artillery, in the main had established a line of defense facing the German bridgehead at Amiens. The enemy also had concentrated his artillery fire on that area. The opponent was weakest in the region south of Picquigny. That was the reason why the 2d Battalion had advanced so rapidly to the high ground southeast of Fourdrinoy, after taking Hill 74 and the small woods 1,500 meters southwest of that point. The 3d Battalion had encountered considerably more difficulties, for it had to break through the defensive positions of parts of two hostile battalions placed one behind the other (2d and 3d Battalions, French 60th Infantry). Nevertheless, exploiting the effect of the air attack, the Battalion by nightfall gained the vicinity of the hostile artillery group at Saissemont. The 1st Battalion had been engaged in mopping up Breilly and the woods south of that locality and so had been unavailable to the Regiment for some time; on the other hand, its action had served to relieve the right flank of the regiment on the left and made it possible to use the eight-ton bridge erected at Breilly for the purpose of moving up additional units.

On the whole, the regiment in the evening was ready to complete the breakthrough across Saisseval, Seux, and Hill 135, southeast of Fluy, on the next day. Up to that time, the Regiment was not aware that an advance in that direction would strike into the midst of the retreating enemy; neither did it know, however, that it would be necessary to overcome a strong hostile rearguard position at Saissemont; and, finally, that it would encounter a new line of defensive positions which the enemy had prepared at Fluy and Revelles.

For the night of 5-6 June, the 2d and 3d Battalions organized in considerable depth, ready to assume the defensive.

The east flank of the 3d Battalion was exposed, since the regiment on the left was lagging about 2,000 meters behind. To cover that flank, the Battalion placed the company in reserve in echelon behind the left flank, in the region and southwest of Romomt Ferme.

At 12:30 AM, the enemy, deployed over a width of several hundred meters, strength unknown, launched an attack from Fourdrinoy and a line 400 meters south of Fourdrinoy, heading eastward. Caught in the concentric fire of the company on the left flank of the 2d Battalion and the company on the right flank of the 3d Battalion, the hostile attack came to a halt about 100 meters in front of the German lines. Combat reconnaissance revealed that the opponent withdrew immediately.

Throughout the night, the hostile artillery kept firing heavy caliber shell, in sporadic barrages, into the low depression 500 meters north of Romomt Ferme. Apparently, the enemy expected artillery to be located there. Other targets of hostile artillery included the woods 1,500 meters north of Romomt Ferme, the depression extending from the crossroads northeastward, the woods west of Hill 99, and the Breilly—Picquigny highway. Hostile airplanes repeatedly dropped bombs in the vicinity of the bridge spanning the Somme at Breilly and at other crossings.

It was to be expected that more heavy fighting would be necessary on 6 June, in order to complete the penetration.

The Division Commander ordered the attack to be resumed at 6:00 AM. At 3:45 AM, the Regimental Commander issued corresponding orders to his three battalions, the 13th and 14th Companies (Regimental Infantry Cannon and Antitank Companies, respectively), as well as to a battalion of light field artillery that was attached to the Regiment for support. No changes were made in the zone boundaries.

The initial objective of the 2d Battalion was designated as the ridge northwest of Saisseval, that of the 3d Battalion as the village of Saisseval. The hills of Revelles were fixed as the regimental objective of the day.

Elements of the 13th and 14th Companies were to remain attached and furnish support as on the preceding day. The regimental command post was ordered to remain near the Breilly—Fourdrinoy road, at a point 500 meters northwest of Hill 99, until 4:30 AM. At 5:00 AM, it was moved to the region of the clump of woods 600 meters northwest of Romomt Ferme, on the boundary between the 2d and 3d Battalions. From that point, one could see the 1st Battalion, well dug in and camouflaged, occupying a position west of the depression 500 meters north of Romomt Ferme.

Hostile heavy artillery, located in the region west of Bovelles, kept hammering this depression, evidently expecting to strike German artillery there. A battery of light field artillery, in position near Saissemont, was firing into the immediate vicinity of the regimental command post, while machine gun fire kept sweeping over that point from the direction of Fourdrinoy. The clamor of battle could be heard coming from the direction of the right flank of the regiment on the left which, at the moment, was located near the small clump of woods east of Romomt Ferme. A hostile machine gun on the high ground just north of Romomt Ferme was plainly seen firing on the right of that regiment; action was taken against it. Romomt Ferme and its straw stacks were in flames. The Regiment jumped off for the attack at 6:00 AM, as ordered. The sound of machine-gun fire could be heard in the region of Fourdrinoy, the region of Saissemont and the region about 1,500 meters northeast of Saissemont.

A message from the 2d Battalion shortly reached the regimental command post, stating that the battalion intended to take Fourdrinoy which was still occupied by strong hostile elements, in order to be able to continue the attack in the prescribed direction. The 3d Battalion reported that it was making no headway because of heavy machine-gun fire on its east flank and frontal fire coming from Saissemont; it called for artillery support on that locality.

Thereupon, the Regiment requested artillery fire to be placed on Saisseval as well as on the patches of woods and the ridge between 1,000 and 1,500 meters east of Saissemont. (It did not ask for fire on Saissemont as requested by the 3d Battalion, fearing that it might endanger the forward infantry.) The Regiment called further for counterbattery against the hostile artillery assumed to be located in the area southeast of Saissemont and in the depressions between Bovelles and Seux.

The artillery support shortly became effective. While the regiment on the right advanced to the attack from the Bois de Neuilly, its left flank pushing on through Fourdrinoy, the regiment on the left remained facing the enemy in a fortified defensive position along a line extending from a point north of Hill 49 to St. Christ Ferme. The Commanding Officer, 63d Infantry, then decided personally to assume command of the regimental reserve and lead it forward

along the boundary between the 2d and 3d Battalions, in order to push the assault. At that moment—it was around 9:20 AM—the Division Commander arrived for a personal estimate of the situation. Among other things, the Regimental Commander informed him that the 1st Battalion of the regiment in reserve had orders to move up in the zone of the 63d Infantry and to place itself at the disposal of the 63d Infantry.

How did the situation meanwhile develop in the zones of the 2d and 3d Battalions? As the Regimental Commander and members of his staff moved forward, they met several men carrying back wounded of the 2d Battalion. Minor elements of the 3d Battalion and parts of the attached infantry cannon and antitank guns were located in the region northwest of Saissemont. There were no signs of the whereabouts of the main bodies of the 2d and 3d Battalions. The Regimental Commander assumed that they had kept on advancing. Saissemont constituted a strongly occupied hostile base. In view of the fact that the regiment on the left was still lagging behind, it seemed more advisable to take that point and so eliminate once and for all the threat in the flank, than to continue the advance in the area west of Saissemont, where the Regiment was likely to suffer heavy casualties. Therefore, the Regimental Commander decided to take the village, even though located within the combat zone of the adjoining regiment. This, he expected, would also clear the path for the expected division reserve which was to complete the breakthrough.

It was around noon when the attack of the 1st Battalion went under way, skillfully pinning down the enemy in front and enveloping his two flanks. Regimental Headquarters now kept forging ahead to the south, in the direction of the letter "v" in "Saisseval," that is, it gave way to the west in order to avoid the hostile machine-gun fire from Saissemont and the hostile artillery fire from the region of Ferrieres (one light battery, shrapnel), as well as to make contact with the 2d and 3d Battalions which were believed to be in that vicinity. On his way, the Regimental Commander met the 5th Company and a platoon of heavy machine guns of the 12th Company. Exposed to flanking fire of hostile machine guns located at Saissemont, these elements had halted and thought it impossible to advance any farther. The Regimental Commander forthwith designated these elements as regimental reserve, ordered them to advance and, encountering but little flanking machine-gun fire from Saissemont, led them in the direction of the letter "v" in "Saisseval," where a small woods is located. While proceeding along this route, the advance was halted by hostile machine-gun fire at a point about 500 meters northwest of Saisseval; the fire came from the woods in the region of the word "Saisseval," as shown on the map. The hostile machine guns shortly withdraw from these woods when the heavy machine guns of the machine-gun platoon of the 12th Company went into action. Around 1:00 PM, observation through binoculars showed infantry in deployed formation, some two and a half kilometers away, ascending the high ground west of Seux and moving southward. The general situation and repeated observation by several officers indicated that the riflemen were elements of the 2d Battalion. In reality, they were hostile forces on the retreat, two companies strong. Altogether there was still no information about the whereabouts of the 2d and 3d Battalions, the situation gradually became clearer. The hostile machine-gun fire from Saissemont and Saisseval as well as misorientation had caused both battalions to move too far to the west and enter the zone of the regiment on the right. In so doing, the 3d Battalion had shifted in front of the 2d Battalion, reached Point 115 (1,200 meters north of Briquemesnil-Floxicourt), and there joined elements of the regiment on the right. The 2d Battalion was located in the region 500 meters north of the letter "S" in "Saisseval."

At 1:10 PM, orders arrived from Division directing that the attack be continued. These orders revealed that the enemy in front of the Corps was giving way to the South. The 63d Infantry, reinforced by a battalion of the division reserve, was to take up the pursuit, continue the advance in its present zone and capture Hill 135, west of Revelles, and the village of Revelles.

By 1:30 PM, Regimental Headquarters, followed by the regimental reserve (5th Company and a platoon of heavy machine guns of the 12th Company), reached the small woods at the letter "v" in "Saisseval."

Fortified positions which the enemy had constructed in these woods, especially machine-gun nests, strong points with short trenches running in all directions, small trenches offering cover against air observation, mines, some of which were emplaced and others that were lying about (small mounds of dirt easily revealed their emplacements), pieces of equipment, cans half full of food—all pointed to the haste of the retreat of the enemy. A captured document of the enemy showed that the command post of the opponent, the Commanding Officer of the French 60th Infantry, had been located in these woods.

Around that hour, officers sent out to establish communication with the 2d and 3d Battalions returned with reports on the situations of the two battalions. It became clear now that Regimental Headquarters and the reinforced 5th Company were the farthest advanced elements in the zone of the Regiment. There was no doubt now that the riflemen seen in deployed formation east of Seux were part of the retreating enemy.

Immediately, the Regimental Commander dispatched a mounted patrol of the Mounted Platoon of the Regiment in the direction of Seux for a reconnaissance. Pending further orders, the 3d Battalion was to move to the northern part of the woods northeast of Briquemesnil-Floxicourt; while the 2d Battalion was to get ready to resume the attack, its left flank advancing in the direction of Chateau Seux. Both battalions were to resume the pursuit as quickly as possible in the direction of Seux. It was likely, however, that that would take quite a while. Meanwhile, the 1st Battalion at Saissemont, where the sound of battle was abating, and the approaching battalion of the division reserve might become available first for the pursuit to Seux. In that case, it seemed advisable to take up the pursuit with the newly assigned, fresh battalion and the 1st Battalion which had seen less action than the 2d and 3d Battalions. The decision on this matter had to be postponed until some later hour.

Between 2:30 PM and 3:00 PM, the situation developed as follows: The 1st Battalion, having taken the village of Saissemont after bitter fighting, had become free for disposition elsewhere and was placed on the left of the frontline

to take up the pursuit. Its boundary was designated to run from the west edge of the woods at the letter "v" in "Saisseval," through Seux, to Hill 135 (west of Revelles). The 2d Battalion, short on ammunition, was directed to replenish its ammunition supply from the regimental trains which meanwhile had been moved up to a point south of Fourdrinoy. A hostile battery, located in the region of Seux, was firing on the woods occupied by the regimental command post and the farthest advanced elements of the 1st Battalion. Thanks to the many trenches and strong points which the enemy had constructed in the woods, the casualties suffered by the 1st Battalion were limited to a few wounded.

While the battalions continued to forge ahead in developed and deployed formation, the artillery opened fire on Seux, Fluy and Revelles. A number of structures could be seen burning in the distance. It was established later that the artillery fire on Fluy and Revelles had been well aimed and scored direct hits on hostile trains, etc. By 6:00 PM, the Regimental Commander learned that the 3d Battalion, in compliance with orders, had entered the woods northeast of Briquemesnil-Floxicourt, and that Saisseval as well as the ridge south of that village were clear of the enemy. No word had arrived as yet from Seux, where a mounted patrol had been sent on reconnaissance.

At 6:25 PM, the Regiment moved out in pursuit of the enemy: The battalion of the division reserve on the right; the 1st Battalion on the left; and the inner flanks of the battalions heading for Chateau Seux. The 3d Battalion received orders to follow the battalion of the division reserve to the region of Chateau Seux; while the 2d Battalion was to follow the 1st Battalion to the area just north of Seux as regimental reserve.

The mission of the battalion of the division reserve was to capture Fluy and the western part of Hill 135; and that of the 1st Battalion to take the village of Revelles. In the course of the advance, the companies of the two forward battalions gradually moved nearer and nearer the Saisseval—Seux road because of numerous hedges obstructing their path. The village of Seux, itself, was found free of hostile troops. As the Regimental Commander and his staff arrived at Seux, the head of the advancing units had already established themselves there. Around that time, a mounted messenger of the Regimental Mounted Platoon arrived with an important message: "Fluy strongly occupied by the enemy."

The two battalions now developed their attack in the direction of the village of Fluy. The frontal assault making no progress, the 1st Battalion shifted more and more to the east in its attempt to gain that locality.

As shown later by captured orders of the French 13th Division, the resistance there was not a case of rear guard action, but one offered by the enemy in a new defensive position. The French orders, which had been issued at 4:10 PM, among others contained the following statement:

> "The orders to withdraw will not be executed. Orders have been issued to hold a line as follows: Small woods east of Guignemicourt—Guignemicourt—Pissy—Fluy—wooded ridge west of Fluy."

Judging by these orders, it was logical that the hostile resistance at Fluy could be overcome only with the greatest effort. The village was not taken until after dark, since the speedy advance of the battalions through Seux and the approach of darkness had prevented the artillery from lending support. It was too late for the infantry to go into action against the retreating enemy who was assumed to be evacuating the region south of Revelles and heading for the southwest. However, the artillery kept the route under fire.

The 3d Battalion gained the region of Seux while there was still daylight; the 2d Battalion pushed on to the region north of Seux; and the Regimental Commander set up his command post for the night at the north exit of Seux. The regiment on the left, echeloned to the left and rear, made its way to the area west of Bovelles.

In the course of 6 June, a number of prisoners were rounded up. They belonged to the French 60th Infantry, against which the Regiment had fought on 5 June, and a so-called reconnaissance group (the captured orders indicated that it was a motorized reconnaissance detachment), the same troops which had offered such stubborn resistance during the hostile withdrawal.

Resuming the pursuit on 6 June, the Regiment that day took Fourdrinoy, which was located in the zone of the regiment on the right, as well as Saissemont, a locality included in the zone of the regiment on the left. It forced the penetration of the hostile front west of Saissemont; continued the pursuit in the directin of Fluy; and, finally, late that evening and in the night of 6-7 June, drove back the opponent once more as he was about to establish a new foothold at Fluy. With the capture of Fluy, the enemy saw his plan to organize a new defensive position foiled at the very outset. In the morning of 7 June, the Regiment had a clear path along which to carry on the pursuit in a southwesterly direction.

MILITARY NOTES AROUND THE WORLD

By Lieutenant J. J. Gleason, *Infantry*

BRAZIL

Trade with U. S. Thrives:

Brazil is the fifth highest buyer of products from the United States, and United States has been in return, Brazil's best customer since 1900, purchasing 40 percent of her total exports. The average American citizen has no realization of the size and wealth of Brazil, which compares with ours in widely diversified character. Brazil has one-eighth of the world's timber resources; a hydroelectric potential exceeded only by five countries; the greatest single high-grade iron ore reserve—12 billion tons; an agriculture producing fibers, fruits, grains, tropical, semi-tropical and temperate products; manganese, diamonds, mica, bauxite, rubber; and on 3 percent of her arable land, she is the world's greatest producer of coffee, second in cacao, third in corn, fifth in cotton and sugar, seventh in meat, and ninth in rice.

(Foreign Press)

CHINA

Air Threat to Hong Kong:

The potential defensibility of Hong Kong is said to be great, with one most unfortunate exception. Due to the rugged country and high hills land defenses of great strength can be, and have been, constructed. Nor have the defenses from water borne attack been neglected. The guns in the various forts are of sufficient size, range and hitting power, to make a naval bombardment a matter of considerable risk. In addition the hills that surround the harbour would make bombardment of ships lying in it something of a problem to the naval artillerist, with his comparatively flat trajectory weapon, even though he enjoyed the advantage of aerial spotting. Thus a fleet should be safe from attack from the sea, and also from the land, unless the enemy cared to mount against the place a full scale military attack.

There is one serious deficiency in the defense, however. The hills which give to Hong Kong so much of its strength, also provide its greatest weakness. There are few places in the Colony where the ground is suitable for the construction of airdromes. Lack of airdromes and air facilities in general lays the harbor open to attack by air. True, a certain amount can be done with a heavy enough concentration of antiaircraft fire, but for a lasting solution of the problem AA fire must be backed up by the cooperation of fighter aircraft. Thus, although it might be felt that the harbour of Hong Kong is well protected against attack from land and sea, it must admit a degree of vulnerability from the air.

(China Weekly Review)

CUBA

Vital Resources Surveyed:

Cuba is possessor of at least four strategic metals needed in U. S. defense program. They are manganese, chromium, tungsten, and antimony, all consumed and imported by U. S. in large amounts. Washington interest in making the island an important source of supply has been currently demonstrated by six months survey of Cuban mines and resources just concluded by U. S. official, Charles F. Park. Cuban supplies of none of these metals would be sufficient to satisfy U. S. needs, but they can make an important contribution.

(The Hemisphere)

GERMANY

Quick Anodyne Used:

An interesting and effective expedient in the line of military medicine reportedly has been devised by the Germans. There is an inside pocket in the lining of the lower left corner of the German soldier's tunic. In this pocket, which is readily accessible, an emergency bandage soaked in antiseptic is carried when the German soldier goes into battle. Then, in case the soldier is severely hit, he can reach this bandage with little effort—not having to fumble with pouches or containers—and can quickly apply it to the wound, thus greatly reducing the danger of infection.

(Lars Moën; *"Under the Iron Heel"*)

The Magnetic Terror:

In this war, it was the magnetic mine which constituted a serious threat to the British Admiralty. It looks like a small torpedo about eight feet long and two feet in diameter, and it can be laid from plane, submarine or surface ship. If dropped from aircraft, the mine floats down slowly on a parachute to avoid dislocating its sensitive firing mechanism on striking the water. At the surface it automatically discards the parachute and sinks to the ocean floor.

Inside the mine is a magnetic needle on a swivel. When a ship passes over it, the steel hull tips the needle, making an electric contact which detonates the T. N. T. charge.

The magnetic mine is effective only in shallow water. At depths over 100 feet the magnetic field of a ship seldom reaches it; and if it does, the explosion does not seriously damage the hull of the vessel. Since most harbor approaches are fairly shallow, however, the German invention was a deadly one.

The feat of conquering this menace is one of the unpublicized heroic epics of World War II. A British engineer took a magnetic mine apart at the risk of being blown into small pieces at any moment. Once its principle had been discovered, a few weeks of feverish research developed the so-called DeGausse Girdle: a system of electric cables placed around a ship which neutralize its magnetic field. As soon as all British merchantmen can be equipped with it—all naval vessels already are—the usefulness of the magnetic mine will be no more.

(Current History & Forum)

German War Costs High:

According to the Department of Commerce, Germany's expenditures in the war in the course of 1941, if maintained at the current monthly rate, will exceed 72,000,000,000 marks, or approximately 72 percent of the national yearly income. How long this rate can continue is anyone's guess, but it should be remembered that this sum does not account for the occupation costs imposed by the Nazis on Denmark, the Netherlands, Norway, Belgium and France.

(Foreign Observer)

GREAT BRITAIN

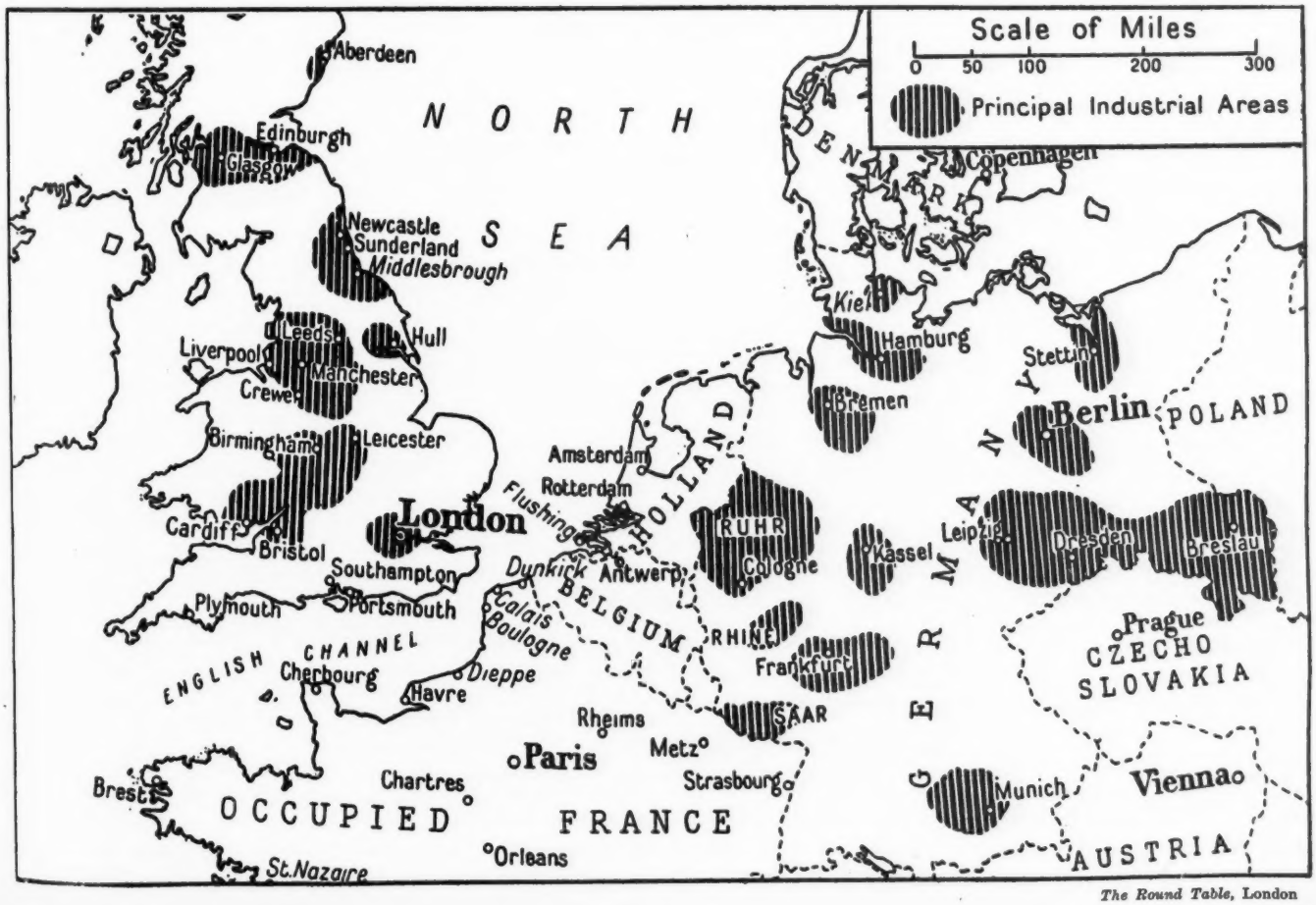
Now You See It, Now . . .

Whole cities, of course, cannot be hidden from the bomber. But in a desperate effort to save vital factories, often scattered over suburbs and rural areas, the British have made an exhaustive study of anti-bombing camouflage.

During the first World War, "flash-painting" was used. Jagged, multi-colored lines of paint confused the observer by distorting the contours of the objective—on the principle of the zebra's stripes and the antelope's markings. Camouflage engineers have found, however, that blending is more effective against aerial marksmen. Roofs of vital buildings are painted the same color as the surrounding grass, stone or gorse, and further disguised with bushes and boulders. Side walls are covered with trellises and artificial vines. So weird is the conglomeration of exotic growths on and around the great Woolwich Arsenal that the workmen call it "the bloody greenhouse."

Military trucks, so often an easy target for low-flying, "strafing" planes, are now so equipped that they can be made, as one cockney put it, "into a blinkin' movin' forest." Netting over the tops and sides holds green leafy branches, and small bushes can be attached to the wheels. When a truck column so disguised drives off the road into a border of trees or into the underbrush, it vanishes from the aerial observers' sight as though by magic.

Both the British and the Germans take their blackouts seriously. Experiments have shown that a lighted match



The Round Table, London

can be seen by a plane half a mile away. An oil lantern is clearly visible from a mile and a quarter, a lighted window from 12 miles.

Some things cannot be blacked out. Steel mills cannot completely cover the glare of their furnaces and converters. Docks and railroad yards always show a little light. Worst of all is the unextinguishable glow of rivers. Even on the darkest night a strip of water shows up clearly. The Thames, with its characteristic windings, is an infallible pointer for the German Luftwaffe on its way to London.

Even the most careful camouflage does not always conceal the object when a clear photograph is taken of it. A black and white photographic print shows contours very sharply and dispels the illusion which blending creates in the human eye.

Since it is difficult to get close to an important base by daylight, the air forces have been developing night photography. When the reconnaissance plane is over the area to be photographed, the bombardier-cameraman releases a magnesium bomb. At a set height, it explodes with a burst of bright white light. At the moment of most brilliant intensity, the light activates a photoelectric cell on the aerial camera in the plane, which trips the shutter and takes the picture. In a picture taken from 1,200 feet, every tree and every shack over a radius of three miles stands out in clear detail.

(Current History & Forum)

Dreadnought vs. Bomber:

Germany's successes against Britain have raised to a new pitch the controversy over the question whether the influence of seapower on European and world history has passed its zenith.

Like blockade operations, fleet tactics have been profoundly modified by the striking effect of land planes cooperating with ships in waters within range of air stations. This was first demonstrated in the Norwegian campaign, when Britain's naval vessels were unable to prevent the transfer and supply of Nazi forces to Norway. At Dunkerque, however, seapower, in conjunction with local air superiority and poor visibility, accomplished the rescue of the defeated British Army. Later, it helped to prevent the invasion of Britain and enabled the British to supply their forces in distant sectors. In the Mediterranean, the exploits of the British Mediterranean fleet during the winter in 1940-41 seem to contradict any blanket affirmation that seapower is ineffective in European waters. On the other hand, the success of the Germans in transporting a strong army to Libya under cover of their own bombers, while British vessels were in the eastern Mediterranean, demonstrates the limitations of British control of the middle sea.

Thus the conflict between advocates of seapower and airpower cannot yet be settled. As in the case of other doctrinal disputes of this sort, extreme views tend to cancel out, so that the issue becomes one of the proportion in which the various elements of strength are to be utilized and the functions they are to serve. Pending more conclusive tests, it can only be said that the efficacy of surface naval forces has been sharply limited in the narrow waters around Europe—how sharply, it remains to be seen; and that the coordination of superior military power above, below and on the sea is now desirable if control of those waters is to be gained or held.

(Foreign Policy Reports)

Air Statistics Differ:

Estimates of plane losses by Great Britain and Germany are greatly at variance. As of March 30, 1941, Great Britain admitted the loss of a total of 1,722 aircraft since the war began, and claimed to have shot down 5,040 German planes. Germany, on the other hand, claimed that during the same period, 3,299 British planes were destroyed and that only 1,060 Nazi aircraft were lost.

(PM)

Pets Have a Part to Play:

Because thousands of dogs and cats were, for humanitarian reasons, destroyed at the outset of the war by their London owners, the rodent population of the city has more than quadrupled and authorities are taking drastic measures to guard against any outbreak of plague—such as those which wiped out entire communities in the Middle Ages. Aside from that danger, the rats and mice have made serious inroads into food stores. The uncontrolled breeding of cats and dogs is now encouraged in England as the simplest measure of killing off the rats. It will be remembered that it was said in 1938 that Madrid fell not to the forces of General Franco but to the plague of rats which consumed a great part of the food stores of the besieged city. Most of the dogs and cats had been killed and eaten, just as happened in Paris when that capital was under siege in the Franco-Prussian War.

(Foreign Observer)

Time Counts in Combat Orders:

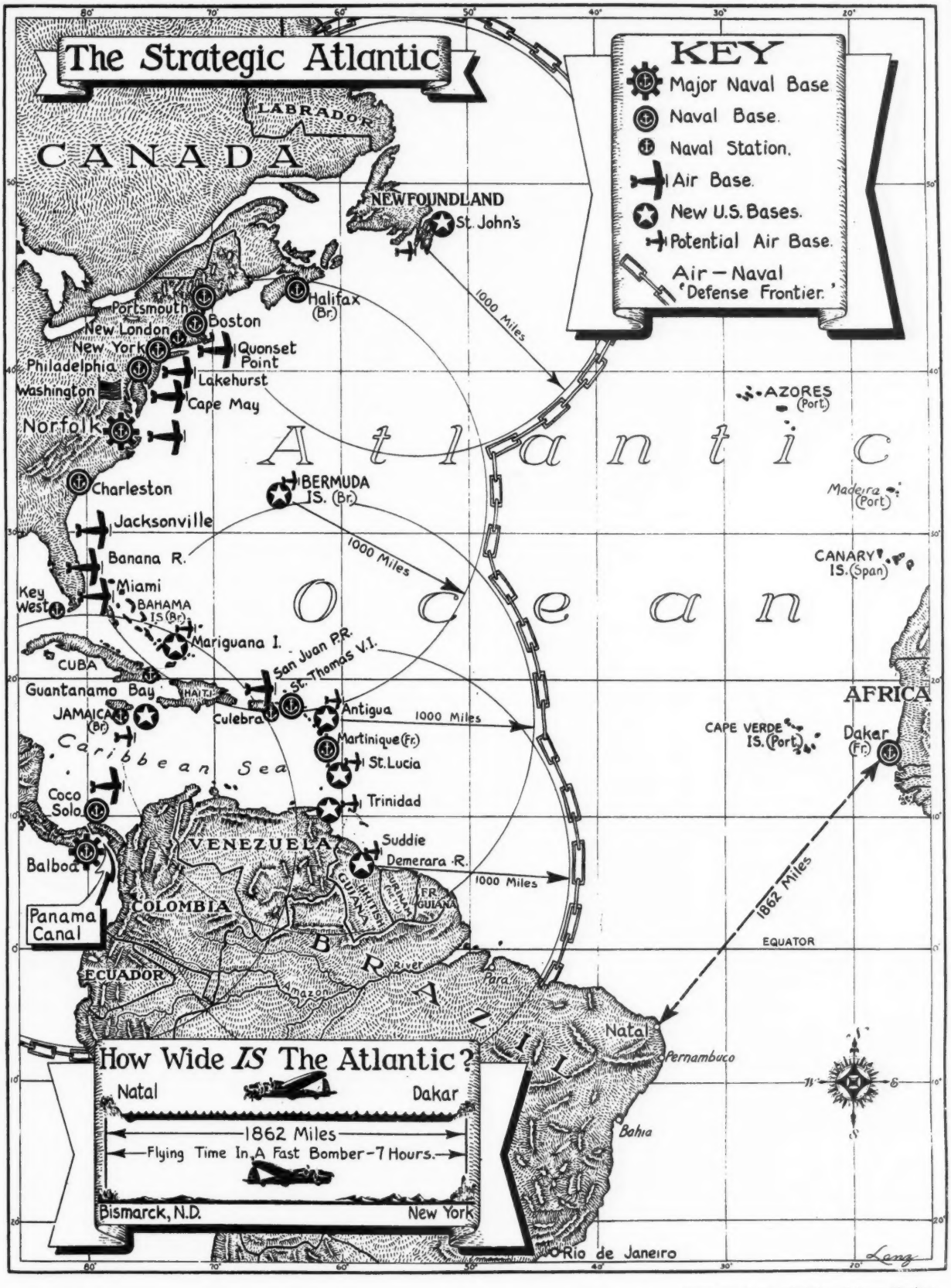
Over-rigid secrecy in the sending of combat orders results in loss of time and serious danger in the long run. During the fighting in May 1940, British orders were radioed in code for fear they might be tapped; the upshot being that it took three hours, on an average, to produce air support on demand by an armored division. The German time was about twenty minutes. They did not hesitate to send messages in the clear when time was essential. "All bombers to Cambrai" was one German message tapped by the British. Another, "All fighters to Arras"; and the answer only ten minutes later: "All fighters on the way."

(Fighting Forces)

Sea Hornets Can Sting:

In the English Channel, the battle of little boats is going on—Nazi speedsters of about 90 tons and the British Navy's "baby battleships" which can streak through the water at close to 50 miles an hour. Some of these midgets can make voyages of 600 miles and more, entirely unaided by other vessels.

The small vessels carry torpedoes and machine guns. In an attack, the speedboat aims itself at the enemy craft, drops its torpedoes, then swerves out of the way. They have no antiaircraft guns because such weapons are too heavy and because the boat's "dodging power" is so great



Courtesy of the Christian Science Monitor.

that a plane has only faint hope of ever hitting them. The speedsters bear depth charges which spell disaster for any submerged submarine they find.

These little ships are so quickly produced that a whole flotilla of them can be made in half the time it takes to build one modern destroyer. And a whole flotilla costs only as much as one destroyer. Each boat carries only about a dozen sailors, so they are very economical in manpower.

(The War Weekly)

JAPAN

Diesel Engines in Autos:

In Japan, the "Izupu" Company has undertaken the manufacture of automobiles equipped with Diesel engines. The production program provides for the manufacture, during the initial period, of chassis for motor buses and trucks of the normal type of construction. The chassis of both types of vehicles have two axles and double rear wheels. It is planned to equip these chassis with Diesel engines provided with 6 cylinders, which have a diameter of 95-mm, a piston stroke of 120-mm, and a piston displacement of 5.1 liters. The ratio of compression is 1:17. The cylinders form a single piece with the upper half of the crank case. The motor vehicles are equipped with a hydraulic brake acting on 4 wheels and a differential brake operated by hand.

(Auto-Bronetankovy Journal)

Attention Turns to Sky-Troops:

Japan is reorganizing her air force according to the German model. Nothing much has been heard of the replacement of the mostly obsolete flying material of the Japanese Army and the Navy air arms by more modern German and Italian types but recent reports indicate that parachutists and air landing infantry units have been set up. More than 12,000 volunteers have been accepted for training as parachutists in the new training centers at Nagasaki, Tsuruga, Kobe, Seul, etc.

The pre-military aeronautical training of Japan's youth has recently been carried forward by the creation of the Dai Nippon Hiko Kyokai, the Japanese Aeronautical Association, which is organized on lines similar to the National Socialist Flying Corps and the Italian RUNA.

(The Aeroplane)

RUSSIA

Soviet Cannon Improve:

Notable progress has been made by the Russian Army in recent years, especially with respect to the artillery.

Each infantry division contains a field artillery regiment composed of three or four groups. Three of these groups are armed with 76.2-mm cannon and light 122-mm howitzers, while the fourth group, which does not exist in every regiment, has 107-mm cannon and 152-mm howitzers.

Each *cavalry corps* is armed with a 114-mm howitzer, whose principal characteristics are as follows: weight of projectile, 15.9 kg; range, 7,500 meters; weight of piece, 1,380 kg.

The *mountain artillery* is armed with the Schneider 76.2-mm gun M 09. Its principal characteristics are as follows: weight of projectile, 6.4 kg; range, 7,100 meters; weight of piece in battery, 625 kg.

The *corps artillery* consists of the 107-mm cannon M 10/30 and the 152-mm howitzer M 09. Both guns, which are of French origin (Schneider-Creuzot), have been modernized; the barrel of the 107-mm cannon has been lengthened and its range has been increased from 8,700 to 12,000 meters.

The *heavy artillery* comprises, in addition to the guns used during the World War, a new 150-mm cannon, a 210-mm cannon, and a 210-mm howitzer. The cannons are transported on caterpillar tractors.

The *railway artillery* comprises 305-mm and 406.4-mm howitzers.

The *AA artillery* comprises 40-mm Vickers guns of two models, 76-mm cannon M 28, 76-mm cannon M 33, and "Leningrad" 105-mm cannon M 34.

(Krasnaya Zvyezda)

SWITZERLAND

New Gun for Old:

A 105-mm Bofors gun has been substituted for the old 120-mm cannon in the Swiss Army. Its principal characteristics, are as follows: length in calibers, 42; muzzle velocity, 785 m/s; weight of projectile, 15.3 kg; range 17 km; elevating limits, -5° -43°; traverse 60°; weight in battery, 3,750 kg; split trail. The "Sauer M 6" tractor is used in hauling it.

(Der Schweizer Artillerist)

UNITED STATES

Air Spotters Organized:

Army Chief of Staff General George C. Marshall announced in April that between 500,000 and 600,000 civilians will be enrolled before the end of August as volunteer observers in a nation-wide network to warn against aerial invaders. The civilian spotters will be affiliated with the interceptor commands of the four army air forces at Mitchell Field, N. Y.; Felts Parkwater, Wash.; Tampa, Fla.; and Riverside, Cal. General Marshall said groups such as the American Legion, the women's auxiliaries and Coast Guard, Forest Fire Wardens, weather observers, and the Civilian Conservation Corps will be included in the warning grid.

More Maps in Preparation:

Acting WPA Commissioner Hunter recently disclosed that 1,000 cartographers, draftsmen and clerks drawn from WPA rolls are revising maps of "vital spots in the nation's defense plans" covering an area aggregating over 200,000 square miles along the Eastern Seaboard, the Great Lakes States, the Mexican border and the West Coast. The work is being done under the supervision of the Army Corps of Engineers.

Speed Defense Program:

OPM Production Director Biggers, speaking before the U. S. Chamber of Commerce, recently said national defense "progress seems phenominal" but vast increases are still necessary. He gave the following breakdown of monthly production progress in vital defense products and predicted necessary increases:

	Since May 1940	*Before end of 1941*
Airplanes	trebled	must be doubled
Tanks	600 percent increase	must be quadrupled
Powder	1,000 percent increase	must be trebled
Small arms ammunition	1,200 percent	
Garand rifles	360 percent	must be doubled
30 calibre machine guns	trebled	must be increased five-fold
50 calibre machine guns	quadrupled	must be increased five-fold

Mr. Biggers said "we must spread existing contracts and place new contracts throughout a wider segment of industries than has been utilized so far." He said this should be done by placing many contracts with competent prime contractors who will be responsible for training subcontractors and "mothering the job" even if they "farm out most or even all of the manufacturing."

More Reception Centers:

The War Department has authorized construction work to increase reception center facilities from a total capacity of 32,700 to 48,750 men at an estimated cost of $8,970,000. The program calls for establishment of eight new reception centers, increasing facilities of thirteen existing centers, construction of induction buildings at five posts, and completion of construction of fifteen centers, the Department stated.

New reception centers being established are at Camp Beauregard, La.; Fort Benning, Ga.; Fort Jackson, S. C.; Fort Oglethorpe, Ga.; Scott Field, Ill.; Fort Crook, Nebr.; Fort Logan, Colo.; and Camp Wolters, Tex.

Hike Pay for Parachutists:

Congress sent to the White House on May 21 a bill increasing the pay of parachute troop officers by $100 a month. Enlisted parachutists will receive a pay increase of $50 a month.

The Army's "Navy" Grows:

Some 400 additional boats have been purchased, more than doubling the Army's present "navy" of 330 harbor craft, which include mine-laying boats, passenger and freight vessels, ferry boats, rescue boats, launches, and self-propelling barges.

Gas Masks Ordered:

Preliminary plans have been made for construction of a $1,000,000 Government-owned gas mask control plant at Fostoria, Ohio, to be operated by the National Carbon Company, Inc. "To develop sources of supply should gas masks be required in considerable quantities," the War Department has placed orders with a number of companies. for "a limited quantity" of low-cost "noncombatant" gas masks for use in areas under military jurisdiction and control.

Munitions Stepped Up:

There are 35,000 workers now employed in army arsenals, as compared with 13,000 in 1939. Comparative production of arms and shells at these arsenals during the two year period is as follows:

	Produced in 1941 (per month)	*Produced in 1939 (per month)*
Average rounds of small arms ammunitions	38,000,000	7,500,00
Artillery cartridge cases	560,000	43,500
Fire-control instruments	330	38
Artillery shells	406,000	13,900
Garand semi-automatic rifles	15,000	912

(U. S. Information Digest)

"Modern conditions of military action demand . . . constantly increasing technical skill from fighting men. The equipment, which the force of events has introduced into the ranks, demands the gift, the taste, the habit of serving it. This is a consequence of evolution, ineluctable in the same way as the disappearance of candles or the end of sundials. The era of picked soldiers and selected crews has arrived."

General Charles de Gaulle, in 1934;
Toward a Professional Army

Foreign Military Digests

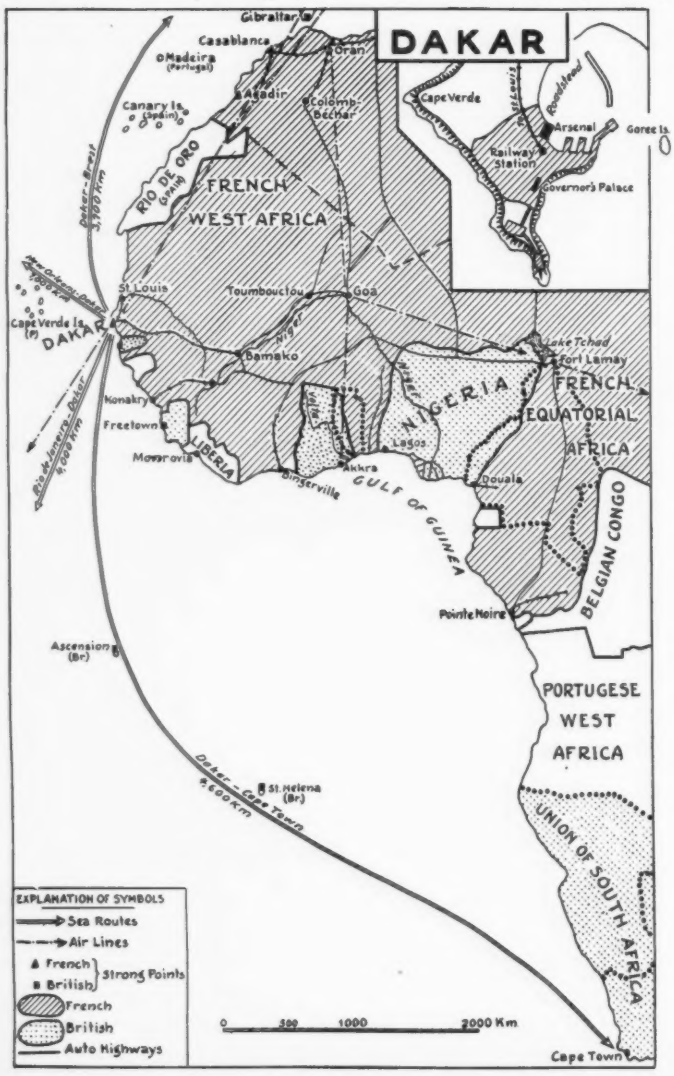
Digests of articles from foreign military periodicals; other items of interest from foreign publications are summarized in the Catalog of Selected Periodical Articles.

Dakar

["Wehrpolitische Skizzen zum Zeitgeschehen-Dakar," by Colonel Rudolf Mlaker, retired, German Army, in *Militärwissenschaftliche Mitteilungen*, February 1941. Translated from the German by Mr. La Vergne Dale at the Command and General Staff School Library.]

From 23 to 25 September (1940), English sea forces tried to get possession of the French naval base at Dakar by surprise attack. Five landing attempts of the British were repulsed by French forces stationed at the port.

Dakar—French since 1857—is the capital of French West Africa. It has 93,200 inhabitants, of whom 7,000 are white. It is the residence of the Governor-general, who has under him Dakar, Senegal, French Guinea, the Ivory Coast, Dahomey, the French Sudan, Mauretania, the Niger Territory and the French portion of the Mandate of Togo. The port and city are situated a few kilometers east of Cape Verde, on the west coast of Africa.



Dakar is a French naval and air base of considerable importance. It is also the best transfer and storage port for petroleum within a wide radius. Modern wharf arrangements, extensive storage facilities with some of them concealed, a large dry-dock, immense warehouses, modern pumping plants (to transfer oil in shortest time) are worthy of mention. Dakar is not alone a port for importing and exporting oils, fats and tropical fruits for the great French colonial region, but it is also important as a transfer point for sea and air lines to South Africa and South America. In quantity of cargoes transferred, Dakar ranks third, after Le Havre and Marseilles. Almost two-thirds of all cargoes unloaded are fuel oil and engine parts for boats and airplanes; 750,000 tons in 1938. But 60,000 tons of this went to the hinterland colonies that year. The storage tanks are filled with oil from the U.S.A. or from Latin America. During World War I, Dakar exported raw materials very essential to war and was a port of embarkation for the colored races from Senegambia and the Sudan, at that time employed as French soldiers in all theaters of war. Only the sudden crushing of France prevented a recurrence of this.

The harbor itself is spacious and protected from the southwest by two windbreakers. At present, ships of 35,000-ton size can be accommodated in the harbor. The development of Dakar into a naval base started in 1938 and was incomplete at the start of the present war. The Island of Goree, at the harbor's entrance, is strongly fortified and heavily armed. The modern fort of Bel Air is on the mainland. It also serves to protect the seaplane harbor. The port city is the terminus of a railway which runs to St. Louis, on the Senegal river, to Upper Senegal and to Bommako, on the Niger. Several automobile highways lead into the interior. Dakar is also an important airport for the west coast air lines and connects with the trans-Sahara air lines.

The reasons for the British attempts against Dakar are of political and military nature. England is doubtless considering the threat against her positions in Egypt and on the Suez canal. Since traffic is impossible through the Mediterranean, the sea lane along the west coast of Africa and around the Cape steadily grows in importance to her. To

protect the route around the Cape, the excellent seaport of Dakar would have been a welcome possession. Besides, this strong point was to have played an important part in the contemplated distant blockade of Europe—along a line from Canada to the west coast of Africa. Further, one of the motives for the armed coup against Dakar was probably the destruction of the French naval vessels which lay there. Events also have proved that Dakar has excellent natural flank protection in the coastal zones to the north and to the south of the port.

There is no practicable harbor for at least 2,000 kilometers (about 1,250 miles) north of Cape Verde. The coast is steep—occasionally has flat sand beaches and dunes—with numerous reefs and cliffs. The coastal zone south of Dakar is shut off from the open sea by lagoons, sandbars and stretches of swamp. It cannot be reached by boats of any size. This natural protection against the landing of large units (Einheiten) also enhances the natural value of this strong point.

Junior Leadership

[From an article in *Army Quarterly* (British), January 1941.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

Several thousands of young men are engaged at the present time in learning to become officers. They are keen and eager, as befits healthy young minds setting out to do something new in the world, and are busy, in their various training units, learning the rudiments of an education widely different from anything that they may have visualized for themselves in their civilian careers. Sooner or later they will find themselves, for the first time in their lives, in command of a body of other young men, for whose welfare, training and probably their very lives they assume responsibility: a responsibility guided no doubt by their senior officers, but, nevertheless, one which is definitely their own and which they will not want to shirk.

Now here is the hardest part of their task, for while military knowledge can be acquired by study, the ability to lead others successfully is not one which lends itself readily to instruction by text-books, while even the military teacher of experience finds it difficult to impart his own hard-won knowledge. Nevertheless, it is in his ability to lead his men and to inspire their unquestioning confidence and good will that the young officer will prove himself capable in his new, even if only temporary, profession.

What, therefore, must he do to fit himself for the task? For though we are told that great leaders are born and not made, there is no need for any young man to feel that this rules him out automatically. He can, if he sets about it in the right way, at least become an average leader, and may find that he has the natural ability for his work.

Confidence comes first of all in not expecting the impossible of oneself, and, secondly, in the possession of military knowledge which has been acquired in the training unit and which will naturally be wider and greater than that of the men one has to command, though many of the latter in these days will, if they show ability, receive the same opportunity later on.

Thus fortified with this knowledge, the self-confidence which it imparts, and the determination to be a real leader, the young officer need not fear being laughed at if he makes mistakes now and again. He will, if he is wise, laugh with his men, though admittedly this depends on where the mistake occurs. A well-known after-dinner speaker famous for his epigrams once said: "We all make mistakes sometimes, that is why we have bumpers on motor cars and erasers on the ends of pencils."

We will assume then that our leader is acquiring confidence in himself; that, being human, he is bound to make mistakes here and there; but that he will not thereby forfeit the growing confidence of his men. We may imagine his men saying in the barrack room: "Young so-and-so's a decent young bloke; he doesn't know much yet but he's learning, and he doesn't try to cover up his mistakes with a lot of bluff either." So far the young officer has been preparing himself for his task, and it will be assumed that he is losing no opportunity of increasing his military knowledge and thereby his own self-confidence and the respect of his men. But there is much more to be done yet, and perhaps the harder part is still to come, for what the young officer must aim at achieving is not merely the respect of his men but also their implicit trust in him as their leader—and that is a far deeper thing.

How is he to set about this? It is not easy; for here experience counts, and the best way for him to start is to remember that the men under him are all human beings exactly like himself, and that all human beings have the same instincts. If he has not experienced them already, it is safe to say that at some time he will experience hunger, love, hate, fear and anger, and at times he may need the help and advice of those above him. In just such a way the men whom he is leading may require it, and, if he cannot give help, he can at least give sympathy; but he cannot do this unless the men feel he is their friend as well as their leader and that they can trust him. Slowly, therefore, for this sort of thing cannot be rushed, the young officer must learn to know each man under him. He must approach his man indirectly, and, above all, naturally, by playing games with them, by asking a man during a five minutes' stand easy where he comes from, what he was doing before he joined the Army, and so forth—just as one man to another. By slow stages he will find men telling him about their homes and parents, their plans for the future and a hundred-and-one details which mean so much in the lives of all men. The young officer will learn to value these confidences, which will prove that his men trust him, and, if he is wise, he will not abuse their trust.

Although the basic instincts of human beings may not vary, yet individual personalities and characteristics are infinite, hence the need for knowing each man. Broadly speaking, however, the young officer is bound to find representatives of certain types among the thirty odd men under his command. For instance, he is sure to find one who is accepted by all as the humorist of the unit. A useful type this, who will prove invaluable in times of adversity, when the blankets or rations go astray, even if in better times his wit may be directed in more awkward directions. Then there will

be the diffident type of man who needs encouragement and will then produce a best which may surprise both himself and his leader; the shy man and the reserved, silent man who will be harder to get to know. There will be the "grouser," who is won over if he can be persuaded to laugh at himself, and there will be the ambitious man who wants to get on; there is likely to be at least one man who modestly confesses that he is working in his spare time to qualify in some civil profession. These last must be given encouragement and perhaps help. There is certain to be one man who is disliked by his fellows. The reason for this must be discovered; not by questioning them, for this is "not cricket;" but it will emerge with patience. Sometimes the cause can be removed by a bit of helpful advice; but sometimes the man may have definitely antisocial propensities such as thieving, in which case there is not much to be done, except to see that temptations are not placed in his way needlessly.

It is not wise to trust too much to the opinion of the sergeant; too often he will say, unless he is a natural judge of human nature, "Good man, sir," and leave it at that. The budding leader must learn to judge men for himself. He will make mistakes, of course, and from time to time he may be let down. If he is, then is the time for him to punish severely. Broadly speaking he will experience no difficulty with ninety per cent of his command, but he is bound to find one or two who will not respond in the ordinary way—yet even these can be got 'round in one way or another.

Never rebuke a noncommissioned officer in front of the men, and in any case as often as possible address him by his rank. The latter helps to gain him that respect which a lately promoted man may have difficulty in achieving by himself. It is perhaps a platitude to say that the way *not* to get to know your men is to drink with them. This may be relaxed in a special case, such as a sergeants' dance; but even then hardly at all. The men themselves will not appreciate this form of familiarity. Never use sarcasm, however tempting it may be, and remember that one sin which is unforgiveable among soldiers themselves is to cast doubts on a man's parentage.

Remember that soldiers cannot answer back; therefore as far as possible confine rebukes to something short and sharp, and try, above all things, to be just, even to the point of leniency. Be generous in encouragement, but in a way that really means something, and do not give it just as if it were a matter of course. When talking to men look at them, and let them feel you are talking as one individual to another and not as if you were addressing a lamp post. See that the noncommissioned officers are as fair to the men as you are yourself. Do not let them pick out scapegoats and be sure that none is taking levies from the men for illegal services or otherwise abusing the privileges of his rank. All these points may seem trivial, but they mean a lot if the young officer is going to be a successful leader of men. In the same way, it may seem superfluous to say that an officer's first thought must be for his men. Yet how often in training do we find that the young officer, safely housed for the night, has entirely forgotten to find out whether his men have been fed and housed, and may not even know where to find them. No, these matters are not trivial, and they are often, far too often, forgotten or neglected by those with experience enough to know better. One last hint: having plumped for a course of action, let no hint of uncertainty creep into your voice. A firmly given order will dispel any flicker of doubt you may have had, and by giving you and your men the last ounce of confidence will probably see all of you safely through many an awkward situation.

It is not intended here to go beyond the stage of learning to become a leader. Discussion of the practical application of this learning to the leading of men in warfare must be left for another occasion. But, in any case, to have acquired the right way of handling men during the period of training at home is by far the most important step towards mastering the art of leadership in the field.

It will perhaps have been noticed that attention has been directed throughout this article towards the individualistic side of leadership, and that no mention has been made of *esprit de corps* and morale. But it is not to be inferred that these are one whit less important than formerly. The truth is that the spirit of an army is in effect the spirit of each individual soldier. Hitherto there may have been a tendency among some to build up *esprit de corps* on mass rather than on individual lines. But today our soldiers are educated men who think for themselves, so that each one must be studied in order that the best may be combined in one indivisible and unbeatable whole. After all, the trainer of a football team aims at getting each player at his best in the place that is most suited to him. A platoon of soldiers is also a team made up of men, each one with his individual characteristics. It is the leader's task to learn, by careful study, how to make the best use of these characteristics. He will get to know upon whom he can rely as scouts and runners; which men will make good noncommissioned officers, and which can be trusted not to lose their heads in an emergency. In their turn the noncommissioned officers and men will know that they can trust their officer. In battle such knowledge and mutual trust are essential; they make the difference between death and life, failure and success.

Tanks Against Warsaw

[A passage from "Panzer packen Polen," contained in and translated from "En lisant quelques études sur la campagne de Pologne," by Colonel E. M. G. Montfort, in *Revue Militaire Suisse*, January 1941. Translated in the Library, Command and General Staff School.]

(This vivid excerpt from the German work "Panzer packen Polen" illustrates the psychology of tank attack and the difficulties involved in tank operations against large, populated areas.

While much in the excerpt may be conscious or unintentional exaggeration on the part of the author, still, other sources substantiate the fact that offensive spirit was drilled into German units and that the élan of the Panzer troops in particular was high.—*Editor's Note.*)

"Attack! We, the men of the armored divisions, know what that means. It is the purpose of our existence. Several times already we have attacked successfully over open ground.

"But today there is something new. Eight days after the outbreak of hostilities, we are before a city of 1,300,000 inhabitants, into which a penetration must be attempted.

"Air reconnaissance has disclosed that strong barricades have been erected to bar our entrance into the city. Also, we are naturally expecting the necessity of having to fight from street to street.

"Our Panzer troops spend the night before the attack under the walls of the city, in well-protected bivouac, with firing positions organized on all sides. The guard is relieved frequently, for we do not want to be surprised. From time to time we send a greeting to the city in the form of a shell which bursts afar.

"Five o'clock! A disagreeable night has finally passed. The company commander returns from the group commander's headquarters, where orders have been distributed. He calls the section leaders together to acquaint them briefly with the situation, and to give them orders for the attack.

"I* am chief of the company command group, and I make up a combat crew, in my tank, with the driver and the radio telegrapher. My mission, with two other tanks, is to protect the company commander and, if necessary, establish liaison with the sections, or reconnoiter.

"Six o'clock! Moving into place near the line of departure. A faint feeling of apprehension; no unnecessary words are exchanged; only a few brief orders to the driver and the telegrapher interrupt the silence. I look out from the interior of the turret. Behind me my good motor throbs, and high in the air a few shells whistle. The plan of combat for the company and the order of attack arrive by radio. Our nick-name is 'Buzzard'; and the last words of the order are: 'Buzzard' to the combat. March!'

"The tanks roll along. In front of me the company commander. We cross a high barricade to the left. Our sections are visible in the gardens in front of the houses to the left and right. Rifle and machine-gun fire burst forth; but that hardly disturbs us, accustomed as we are to the sharp sound of bullets which ricochet off the turret. We search carefully for the spots from which this firing comes, and we respond to it.

"Suddenly the section leader of the first echelon reports: 'Two tanks disabled!' Immediately the company commander orders the following section to push forward. This one in its turn is stopped shortly afterward. Why? I do not know. I shall learn much later that it passed over mines.

"Everything vibrates in me; apprehension has disappeared, and the good 'Stimmung' of attack is created. I ask the company commander for permission to take command of the rest of the sections of the first echelon, because the tank of the Second Section leader, which also hit a mine, has overturned.

"Authorization to push forward is granted to me, and I roll onward, ordering the other tanks to follow me rapidly. Trees, little houses, and barricades are crushed, and the first street has been crossed. As we draw near we see everywhere sharpshooters' trenches and breastworks; but they have been immediately abandoned by the Poles, so great is their fear of our tanks. Perhaps they didn't expect to see us arrive from across a mine field. During all this time the fusillade which is raining down on us from the houses has not ceased. I have my eye at the observation slit and, aided by the driver, I seek the proper road to follow.

"We begin to feel the heat in the tank. Sweat rolls down our faces, and we breath in lungs-full of powder smoke from cannon and machine-gun fire. That hardly bothers us; our nerves are too taut. Unfailingly the radio telegrapher maintains liaison with the company commander who is following. The advance continues steadily between houses and across courts into other gardens. Here too, they shoot at us from all sides. A short halt is made to orient ourselves and to permit liaison with the tanks which are following.

"Two hundred meters in front of me appears the angle of a wooden barricade which could be used for cover. I shout to the driver: 'Hannes, full speed ahead!' and point out the direction to him. The motor gives its maximum; I keep up a steady fire during the rush; the barrier is reached. A glance through the rear observation slit shows me, thirty yards behind, the company commander. The other tanks are not following. 'They will come,' I think; and I order my driver to press on.

"Another 200 yards and we find a street which leads to the center of the city. We want to take it because I envision the swift effect the mass of tanks would produce by attaining this objective. 'Hit in the opening!' cries my driver. An antitank shell has shattered the observation slit of the driver and broken the protective glass. The driver can no longer see. I call to him to change the glass, while I feverishly turn the turret and open fire on a wooden shed from which the shell must have come.

"We reach the street. I look quickly behind. Now it is the company commander who is no longer there. In 300 yards three tanks have stopped! Why don't they come? The radio telegrapher continues uninterruptedly to give the order to advance. Dripping with sweat, seated down below in his corner, he telegraphs and hands me up drums of ammunition.

"My machine-gun jams. I withdraw the lock; the socket is broken. Quickly I change the gun. I glance through the observation slit and see a civilian running toward us. A sudden movement of his arm—a grenade flies over and bursts on us without doing any damage. He doesn't have time to throw a second one because my gun cuts him to bits.

"Two hundred yards further along, on a railway embankment, about fifty Poles scatter, running. My machine gun fires again. A hail of bullets mows down the enemy.

"During this time my radio telegrapher has been ceaselessly calling the tanks which remained behind. Suddenly, tuned on the group frequency, he receives the following order: 'Take command of the company and push forward!' What has happened to the company commander? Has he advanced too far without protection?

"Two light tanks and one medium tank rejoin me. The order is given them to advance with me, and to push along this street toward the center of the city. At my right is the medium tank; behind me the two light tanks. While spraying suspicious points with lead, I suddenly see, halfway to my left in a garden, a burst of flame and I hear the explosion of a shell. The munition depot of a 75-mm gun, which was in position ready to fire on us, has been accidentally hit. The entire gun crew has disappeared.

(*) Sergeant-major Ziegler.

"And now, directly in front of us, an antitank obstacle looms up. There is no way to avoid it; we must cross it. Carefully, the tank on my right aproaches it and crosses. I concentrate my fire on the obstacle. All hell breaks loose! In front of us several shells burst in quick succession. The 75-mm gun must now be in position somewhere else. I look for it and fire as hard as I can. While changing a magazine I glance around me. The two light tanks are in flames. Is there another gun behind us? Maybe it's an enemy tank or an antitank gun! I haven't time to think very long. An order is given to the tank beside me to return along the road by which we came; and I fire again at the gun in front of me.

"Before turning, the medium tank received a 37-mm shell in its motor, but the shell did not burst. I grit my teeth and press my head against the gun-sight, contracted by my search for the enemy. Incredible luck! One of the tanks in flames gives forth a smoke which protects me in the rear, while the fire of the enemy in front of me continues to fall short. A shell whistles under the tank, tears out part of the motor chassis, and by its explosion lifts us a trifle off our springs.

"My accompanying tank has disappeared. Now is the difficult moment for us. 'Turn around and go back!' The driver turns the tank sharply, and plunges down the street passing burning tanks through clouds of smoke. Another 50 yards to cover before we reach the garden. I shoot continuously, raking the street with fire. From one moment to the next I expect to receive the fatal hit. It does not come.

"We reach the gardens and roll onto the principal street. Back of us we hear only a few gun shots and several bursts of machine-gun fire.

"From behind a bush a comrade, driver of one of the flaming tanks, rises suddenly. I open the turret cover, call to him, and quickly he jumps to safety into the tank onto the knees of the radio telegrapher.

"A burning doorway bars our path. My driver stops just in front of it; aims directly for it; and at one rush the door flies to pieces. Finally we reach the main road. Several tanks of our group are already assembled here. From the town comes a steady artillery fire which has put several tanks of our regiment out of action by direct hits.

"My turret no longer turns. Perhaps it is owing to the shock of hitting the doorway, or the result of the quantity of bricks which fell on us during the trip between the houses. Upon lifting the turret cover to see better, I observe nearby my company commander leaning against the corner of the house. Impassively, he is defending himself, pistol in hand, against enemy riflemen who are occupying the windows. He, too, jumps into my tank, and we are even more crowded than before. The turret damaged, five men in the tank—battle is hardly an easy matter for us!

"During the return trip, the company commander told me that his tank was put out of action and his radio telegrapher wounded. He sent the wounded man to the rear, accompanied by the driver, while he remained forward and continued to fight with his pistol.

"Finally we reach our original line of departure. Some comrades are already there. Their tanks were destroyed by guns or mines, and they returned on foot. They inform me that one of my men is dead, burned in one of the tanks which took fire behind me. His wounded driver was picked up.

"Several tanks of the group come up from behind in perfect order.

"The attack lasted five hours. It failed on account of the city's powerful defense."

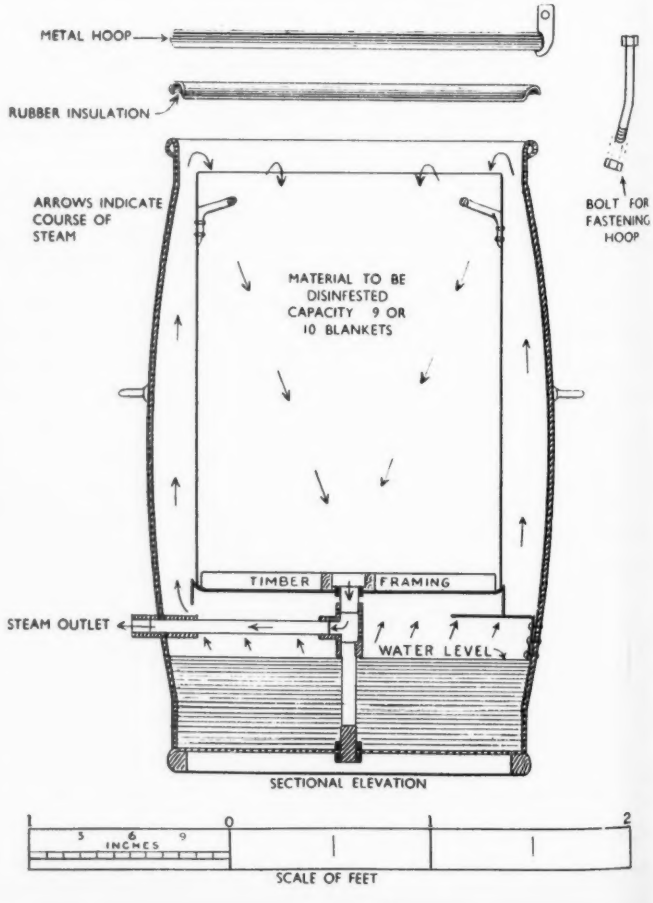
A Portable Disinfestor

[From an article by Major R. Bennett, RAMC, in the *Journal of the Royal Army Medical Corps*, March 1941.]

Condensed by LIEUTENANT COLONEL G. B. DENIT, *Medical Corps*

(We seldom think of prisoners of war as dangerous antagonists, but in 1914 the Serbians captured 40,000 Austrian prisoners many of them sick with typhus fever. It is estimated that the resulting epidemic cost the Serbians 135,000 lives.

Human lice are vectors of typhus fever. To rid military organizations of lice every piece of clothing belonging to infested individuals must be disinfested. Heat is the most practicable method. Heavy steam disinfestors are to be found at large camps, but when small bodies of troops are operating in the field it frequently becomes the function of military commanders to improvise devices to disinfest the clothing of their troops. Such a device is described below.—G.B.D.)



The old type of Serbian Barrel disinfestor has several drawbacks and an attempt has been made to construct a model of similar type but of greater efficiency. To be thorough, disinfestations should be carried out by steam under pressure and using the principle of downward displacement.

The disinfestor described here was made from a steel spirit barrel, an ordinary dustbin and some short lengths of water pipe. The spirit barrel was obtained from a paint factory. It is made of galvanized steel and is provided with an air-tight lid with rubber washer and a metal hoop for locking the lid. When fixed in position the lid is perfectly steam-tight. The dustbin used was obtained from Ordnance. The handles were removed and fixed on the inside so that the dustbin would slip inside the steel barrel and rest on angle pieces riveted inside the barrel. Holes were drilled in the base of the dustbin and the side of the barrel to take short lengths or iron pipe and the whole made steam-tight. The construction is best understood by referring to the diagram.

In working the disinfestor, water is poured into the barrel to a depth of about six inches. The whole is then placed on a trench fire and the container filled with the blankets or material to be disinfested. The lid is fixed on and made steam-tight. It is found an advantage to insert some sacking under the lid to protect the rubber washer from the steam.

When the disinfestation is complete steam is observed coming from the pipe at the side of the barrel and this should be allowed to proceed for ten minutes. The barrel can then be lifted off the fire by the handles and the lid removed. If the blankets are shaken out immediately they will be found to dry rapidly.

The capacity of the disinfestor is about twenty blankets per hour. It has been found to work efficiently and a large number of disinfestations have been carried out with it.

The construction of the disinfestor was entirely carried out by men of a Field Hygiene Section.

Cooperation Between Aviation and Artillery in the Penetration of a Defensive Zone

[From an article by Colonel A. Makovsky in *Krasnaya Zvyezda*, 4 September 1940. Translated from the Russian in the Translation Section, the Army War College, Washington, D. C.]

The missions of aircraft supporting the advance of the infantry in the penetration of a defensive zone are most difficult and highly important. Basically the missions involved are as follows: The aviation conducts a reconnaissance (photographic) of the hostile defensive zone; it lowers the combat efficiency of the enemy, exhausting him physically and lowering his morale by means of so-called wearing-down processes. By this we mean, a systematic bombing of the enemy, day and night, before the launching of the attack. The aviation participates in the immediate preparations of the attack, neutralizing individual targets and supporting the action of the artillery against the more important targets within the hostile defensive zone. It isolates the battlefield from approaching hostile reserves and prevents the moving up of hostile equipment and munitions. It assists the ground forces in overcoming intermediate defense barriers and individual centers of resistance and, furthermore, cooperates in effecting the envelopment and destruction of the enemy. Finally, it covers advancing forces, particularly the shock troops, against hostile aircraft.

All of the above missions, with the exception of the photographing of the defensive zone, may and should be undertaken simultaneously by both the aviation and artillery. Consequently, the close cooperation of these two services in the penetration of a defensive zone assumes vital importance.

To insure the success of this cooperation it is necessary to define clearly the targets and missions of the artillery and aviation in accordance with the capabilities of the artillery and aviation involved. It is essential to work out such means and methods in the employment of the two types of forces so as to preclude possible interference with one another, and to insure their mutual cooperation.

With respect to the question of the capabilities and functions of the aviation in the penetration of a defensive zone, our service publications contain sharply divergent views. Thus, Colonel Chalik in the *Krasnaya Zvyezda* issue of July 18, states that aircraft may even be utilized in the destruction of artificial barriers constructed by the defender. Colonel Tikhonov goes further. In the October (1939) issue of the *Viestnik Vozdushnovo Flota* Colonel Tikhonov declares that if one high-explosive 100-kilogram air bomb should be employed on an average of every 3,334 square meters of ground of the defensive position, there will hardly be left intact a single defense installation, with hardly anyone escaping destruction within the same. Other writers, on the other hand, assert that the employment of aircraft in close tactical cooperation with ground forces, with the infantry especially, would obviously be inexpedient.

We are of the opinion that the potentialities of aviation in general combat cannot be overestimated, and yet it would be erroneous to underestimate the same. It will be wrong to direct aircraft to perform missions such as the destruction of artificial infantry or tank obstacles. And yet we cannot deny that during certain phases of the battle it may be essential to concentrate the entire efforts of available aircraft in the immediate support of the ground forces.

We must always bear in mind that success in war is not achieved merely by the concentration in a particular sector of a large quantity of various types of forces. It is achieved by the skilful coordination of the efforts of all types of forces

in accordance with the particular combat qualities of each of the weapons involved.

In distributing targets between the artillery and aviation, due consideration must be given, first, to the fact that the artillery is capable of discharging greater quantities of metal than the aircraft. Thus, the technical potentialities of the artillery are such as to permit a single heavy artillery regiment within four hours of preparation to hurl forth as much ammunition as would 500 to 600 airplanes of the short-range type of bombers. Secondly, the aim of the artillery fired at average range is far more accurate than that of bombers dropping their missiles from average altitude.

The aviation has the advantage that the distance of a target from the main line of resistance is practically immaterial to it. Whereas the effectiveness of the artillery is materially lowered in proportion as the range of the target increases. Moreover, the aircraft are capable of unloading greater quantities of explosives simultaneously.

It will be apparent from the above that the assignment of targets to aviation that could properly be reached by the artillery will ordinarily be inexpedient. In the circumstances the aircraft would be employed without due regard for its combat qualities, while "air targets" situated in great depth or beyond the reach of the artillery for some other reasons, would meanwhile be left without proper attention. An exception to the above rule may be made only in those instances where, within the hostile defense zone are situated highly important and strongly fortified centers of resistance the neutralization of which calls for particularly strong action. Here the aviation will usually complement the action of the artillery—but not vice versa.

The standard expenditures of aviation material are determined by the actual nature of the situation and by the particular missions which the aircraft are required to perform. At all events, we may consider that to crush an enemy in defensive positions extending over a square kilometer of ground will require approximately 500 tons of air bombs. The thought suggested above once more appears here. The aviation, independently, destroys only those targets that are beyond the reach of the artillery. In so far as all other targets are concerned, the aviation merely reinforces and supplements the artillery employed against them.

In the development of the attack there may be frequent instances when the attacker may encounter within the depth of the defensive zone some centers of resistance that had not been noted before. To crush these with the artillery alone would require much time, especially when firing at considerable range, or where artillery positions have to be changed in the process. Here the aircraft may be brought into action, replacing the artillery, inasmuch as it will, under the circumstances, prove more effective in less time.

We believe that the question regarding the principles of the distribution of targets between the aviation and artillery has been sufficiently well covered. We shall now consider the means and methods involved in the functions of the aircraft, which will insure the best cooperation with the artillery.

Usually, it is assumed that the most difficult task in providing for cooperation between aviation and artillery is the coordination of efforts as to time. The assumption is made that when the airplanes fly across the front line and bombard an objective situated within the range of the artillery, the latter is supposed to curtail its fire in order to avoid hitting friendly aircraft. The actual danger involved, however, is rather small. The trajectory of the shell of modern guns, firing at average range, is not over 1,200 to 1,500 meters above the ground. With the employment of modern antiaircraft weapons, this is a rather low altitude for the horizontal flight of any bomber.

Hence most of the artillery fire will not interfere with the action of the aircraft during the latter's horizontal flight, excepting separate batteries or battalions firing at maximum range.

Matters are more complicated in the case of power-dive bombing. Here the airplanes will at times be in the very thick of the artillery shells and subjected to the accidental hits of artillery projectiles. Unfortunately no data are available of actual combat situations that would enable us to judge the extent of the risk here involved. We know that in all campaigns, aviation has been employed on a most extensive scale and it is believed that hits within the sphere of the artillery trajectory are extremely small. In this connection, it would appear that in each and every concrete instance, higher commanders should decide which will be more advantageous: Whether to curtail for a brief period, in the circumstances, the artillery fire, in order, for example, to permit the hostile infantry to come out from under its cover, and then to subject it to surprise aerial attack, or not to halt the artillery fire at all, and to assume the limited risk of striking friendly aircraft.

Recently our press frequently suggested that it is more advantageous to attack an enemy in defense position with small groups of airplanes, but at such frequent intervals (of 5, 10 or 20 minutes) as to keep him under the constant threat of attack from the air. We are not opposed to this method of action as regards exhausting the enemy during the period preceding the immediate preparation of the attack. During the phase of the immediate preparation of the infantry and tank attack, when it is necessary not merely to wear out the enemy, but to crush him, any such pin pricks will hardly suffice. We believe that during the artillery and aviation preparation of the attack, the aircraft must deliver powerful massed attacks. These attacks must be timed as far as possible with the moment when the infantry advanced to the attack. The attack must not be "general" in nature, and must be delivered at the most decisive moment for the attacker.

Consequently, it is not so important as to whether the artillery fire is shifted or curtailed even in those cases where this is deemed particularly necessary. The artillery, in the circumstances, will have to curtail its fire not every 5, 10 or 20 minutes (in the case of the continuous aircraft action by small groups), but only two to four times throughout the entire duration of the artillery preparation. This will not involve any particular difficulty in the conduct of the artillery fire, especially so in view of the fact that the artillery, by reason of the mechanical structure of its weapons, requires certain pauses during its fire.

In passing it may be well to mention that massed attacks not only simplify the cooperation of the aviation with the artillery, but facilitate also the solution of the problems involved in the protection of the bombers by pursuit aircraft.

The latter are required to secure the action not of the small groups of bombers (of which it will find itself short of sufficient pursuit airplanes), but of larger groups of the bombardment aviation. This will call for less forces than in the case of escorting individual groups in flights at five-and ten-minute intervals.

Cooperation between the aviation and artillery must, furthermore, provide for the mutual assistance between the two services. The artillery, especially, must possess special batteries and battalions for employment against that antiaircraft artillery of the enemy that will be operating against friendly aircraft. The artillery must indicate targets to the aircraft, concentrating its fire against appropriate objectives so as to guide the aircraft to the particular targets, and to the main line of resistance. Moreover, it must engage with its antiaircraft weapons the hostile pursuit craft that interfere with the action of the friendly bombers in the execution of their missions. The artillery, with the aid of illumination and incendiary projectiles may "trace" at night the line of flight for the aircraft into the depth of the hostile dispositions.

The requirements of the aviation include the supply of aerial photographs to the artillery of the hostile defense zone and the protection of artillery observation planes against hostile pursuit craft. The aviation silences the hostile artillery interfering with the functions of friendly artillery; in instances where the friendly artillery is unable to cope with this by itself.

Obviously, this close cooperation will be possible only where careful arrangements between artillery and aviation commanders have been made beforehand; where a detailed study has been made of the plan involved by all those participating in the execution of the same, and where close adherence to the plan by all concerned is insured.

Power-Dive Bombers

[From an article by Captain N. Krainev, Russian Army, in *Krasnaya Zvyezda*, 23 May 1940. Translated from the Russian in the Translation Section, the Army War College, Washington, D. C.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

Recent wars have demonstrated the efficacy of the power-dive bomber. Throughout the Chinese conflict Japanese bombardment aviation has utilized power-diving as the basic method of attack.

The war in Spain afforded many examples of the successful employment of power-dive bombing. We may recall that the Insurgent battleship *Espania* was sunk by two power-dive bombers. The German Junker-87 power-dive bomber was employed for the first time in this conflict. It was utilized in action against seaport objectives.

German power-dive bombers were employed on a particularly extensive scale in the German-Polish war. The results obtained by them created world-wide discussions throughout the military press. The Allied powers, having no aircraft units equipped with power-dive bombers, rushed the purchase of such aircraft in the United States.

Power-dive bombers were employed on an even larger scale in Belgium and France, especially against important small-size targets. German power-dive bombers attacked concrete structures, airdromes, railway bridges, communication centers behind the Allied lines. Of particular interest is the action of German power-dive bombers in conjunction with motorized and mechanized forces against Allied mechanized units on the march and against their infantry. There have also been noted some power-dive attacks on the part of the British bombardment aviation.

Thus the experience of actual combat has shown that power-dive bombing is now beyond the experimental stage and constitutes one of the principal methods in the employment of bombardment aviation.

Power-dive functions may be accomplished from high or average altitudes. Compared to bombings from horizontal flight, they afford many advantages. Power-dive bombing enhances considerably the aiming of the bomber, the striking effect of the bombs, and involves less danger, compared to horizontal bombardment action, within the zone of hostile antiaircraft artillery fire. Moreover, power-dive bombers may combine the bombing of targets with the fire action of their cannon or machine guns.

Action from horizontal flight at very low altitude or "hedge-hopping" aids in hitting the target, but at the same time lowers the striking force of the bomb. Furthermore, where an object is well protected by antiaircraft defense weapons, heavy losses may be inflicted upon such attacking aircraft.

Horizontal action from great altitude may be utilized against extensive areas. The chances of hitting a target of some score of square meters in extent are negligible.

Horizontal bombardment from average altitude will likewise afford slight effectiveness and will be rather hazardous where the target is protected by antiaircraft artillery.

Only power-dive bombing affords accuracy, effectiveness, and striking power of bombs together with lesser danger from the action of the antiaircraft defense weapons on the ground.

The essential features of the power-dive bombing consist of the dropping of the bomb at the moment when the airplane is directly over the target, flying at a sharp vertical angle. Aiming is accomplished by the direction of the airplane itself. When power-diving at a sharp angle the trajectory of the plane and bomb is nearly the same.

Theoretically, it might be said that when power-diving at an angle of 90° the trajectory of the flight of the airplane and that of the bomb are identical. The sharper the angle of the power-diving airplane the greater the accuracy of aim. At the same time errors in determining the exact altitude, speed of flight and variations in the course of flight have a much lesser effect on the accuracy of the attack than in horizontal bombing. There remains, however, the influence of the wind on the flight of the bomb. The effect of wind on the flight of the bomb, however, is less in the circumstances, since the speed of the bomb is increased while the time that the bomb is affected by the wind is reduced.

The striking power of the bomb is increased, since being released in the process of the power-dive, it already possesses the initial velocity of the airplane. In dropping bombs

from horizontal flight the initial velocity of the dropped bomb is zero. The employment of air bombs with reactive propelling devices, affording the bombs additional velocity, further augment their destructive power.

On approaching a target the power-dive bombers enjoy full freedom of maneuver. They do not require a stage of horizontal flight to take aim, as in the case of bombings from horizontal flight. The very act of power-diving is performed in the course of flight, though it involves the loss of altitude at tremendous speed. This flight maneuverability greatly complicates the aiming of antiaircraft weapons. The greatest losses may be expected from barrage fire, but even here matters are facilitated by the fact that power-diving at tremendous speed reduces the time during which the bomber remains within the zone of antiaircraft fire.

Along with the advantages involved in power-diving, there are also certain disadvantages. Targets may be attacked only with small elements. In the circumstances, the dispersed aircraft enable hostile pursuit planes to attack small groups of planes or individual aircraft.

Low clouds preclude power-dive attacks.

The theory and actual practice of power-dive bombing resulted in the construction of a new type of plane—the power-dive bomber. The construction features of the latter include aerlons and reverse screws designed to retard the speed of the craft during power-dive actions. In the case of an ordinary airplane the speed attained in power-diving so intensifies the action of the motor as to increase considerably the radius involved in coming out of power-dives.

The altitude of the airplane in coming out of a power-dive is proportionally greater with the increased speed of the craft. Greater altitude renders aiming more difficult and complicates the bombing. The employment of devices for slowing down the dive of the plane retards the drop and thus facilitates the functions of the airplane crew. The power-diving Junker-87 bomber attains a speed in power-diving of about 470 miles per hour. The employment of the slowing-down devices lowers this speed to 280 miles per hour. For the purpose of increasing the radius of action of the Junker-87, extra gas containers are carried on bomb racks under the airplane wings.

At the outbreak of the Second World War in Europe only the German air service possessed special aviation units of power-dive bombers. These were equipped with the Junker-87 and Henschel-123 planes and were extensively employed in the war against Poland.

The single-motor, two-place power-dive Junker-87 bomber has a maximum speed of 206 miles per hour, a radius of action of about 519 miles, and is capable of lifting one 1100 lb. bomb and four 110 lb. bombs. These planes are employed in the bombing of bridges, railway centers, industrial objectives, as well as against troop concentrations.

The one-place pursuit plane and power-dive Henschel-123 bomber have a maximum speed of about 220 miles per hour, a range of 560 miles, carry 440 lbs. of bombs and are armed with four machine guns. These planes are utilized primarily in action on the battlefield against artillery batteries, machine-gun nests, troops in shelters, tanks and other targets. Both airplanes are also utilized in action against troops on the ground and in power-dive bombing against narrow and small targets. Thus, German power-dive bombers demonstrated the RZL airplane factory in Lublin, bombarded vital railway bridges, radio stations, command posts and other objectives that were less vulnerable to the action of ordinary bombers dropping their bombs from horizontal flight.

Considerable assistance was afforded by the power-dive bombers to their forces on the ground. A major portion of these was attached to mobile motorized and mechanized units with the mission of insuring the continued progress of these units. Contact with the bombers was maintained by radio. The moment that mechanized columns encountered resistance the aircraft were called upon for assistance. Combined air and ground attacks against hostile troop concentrations and antitank batteries soon paved the way for the advance of the Germans.

Aerial attacks were also directed against Polish forces on the march. All approaching reserves were subjected to immediate attacks at a depth up to 30 miles behind the lines.

A few words are necessary on the tactics employed by the power-dive bombers in attacking objectives protected by antiaircraft artillery. A group of five airplanes, two of which are power-dive machines, approach the target at an altitude closely within maximum range of the antiaircraft fire. The power-dive bombers then immediately descend upon the target, acting as if they had been hit by the antiaircraft fire below. The fire of the antiaircraft artillery is then concentrated on the airplanes continuing their flight—meanwhile the power-dive bombers complete their bombing missions.

Extensive use was made by the Germans of power-dive bombers in their operations in Norway and on the Western Front. Those assumed a most extensive role in action against Allied naval vessels. Before the German seizure of the airdromes in Norway the Heinkel-111 bombers were utilized in raids on British naval bases.

The action of the power-dive bombers has been such as thoroughly to justify their existence. The successful action of bombardment aviation, however, calls for the combined employment of different methods in the execution of bombardment missions.

Heroes of the "Fast Troops"

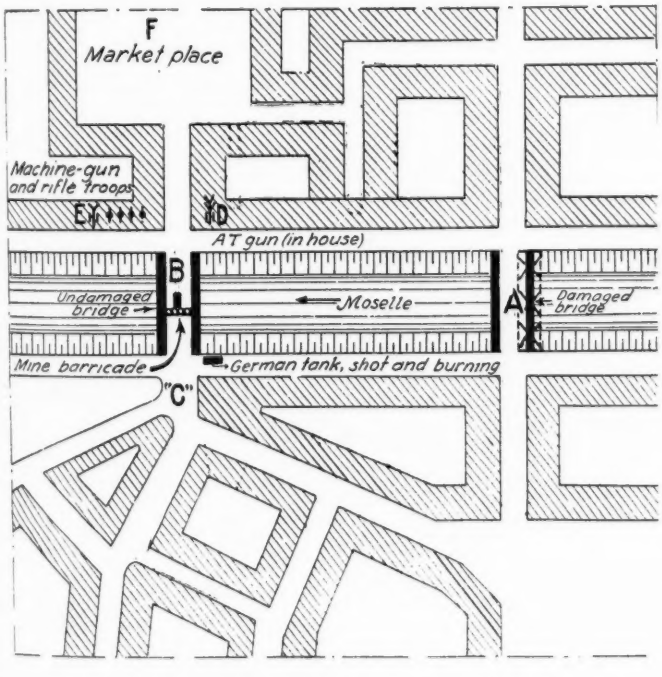
Heroic Action of an Engineer Lieutenant

["Helden der Schnellen Truppen, Heroischer Einsatz eines Pionierleutnants." *Die Panzertruppe*, March 1941. Translated from the German by Mr. LaVergne Dale at the Command and General Staff School.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

In accordance with orders of 19 June 1940, the advance detachment of the division was capturing the Epinal fortress on the Moselle. Part of the fortifications (not shown on the sketch) had been taken. The unseized portion (also not shown on the sketch), which seemed to be stronger, lay across the Moselle.

There was only one good bridge (B), of the six bridges across the Moselle at this place, and it was already prepared by the enemy for demolition. Four bridges (not shown on sketch) had been destroyed completely. The other bridge (A) could be used only by motorcycles and light cars. Further attack and advance across the Moselle depend largely upon ability to take this last bridge (B) before it is blown up. The French are defending from houses on the far side of the Moselle with machine guns (E), antitank guns and rifles (E). A party of reconnaissance officers failed in attempting to reach the bridge and its leader, a lieutenant, was wounded. A German tank, about to cross the bridge, was put out of action (near C) when fired upon and is ablaze.



During the early part of the afternoon, while the French are still busy defending, a party of engineer shock troops and a group of infantrymen, organize under Lieutenant Danzer to cross the badly damaged bridge (A) in order to take over the bridge (B) which the French plan to blow up. Five enlisted men volunteer for the undertaking. Two parties are formed. Lieutenant Danzer leads one. A corporal leads another. They are to destroy fuses and detonating wires. The corporal arrives at the bridge but finds he cannot venture onto it from his (the German) side of the Moselle at point "C." The troops cross the damaged bridge (A). The rifle troops proceed to attack houses in the far side of the city, while Lieutenant Danzer and his engineer troops cautiously advance through the streets parallel to the Moselle toward bridge B. In searching several houses, they find 15 wounded French soldiers and 40 or 50 civilians in one of them. Six or seven French soldiers suddenly appear in a gateway with a machine gun, but again withdraw. At Lieutenant Danzer's request, one of them comes to him. He says he is an Alsatian and that the bridge (B) is about to be blown up. He says a heavy mine barricade is on the bridge, connected by fuses with mine chambers, but that there is no special place for igniting the system. Lieutenant Danzer wants to assure himself of the correctness of these assertions, and goes to the corner building near the bridge with his men. From windows, there, he inspects the bridge and finds the assertions of the Alsatian to appear correct. An antitank gun found in the building (D) is put out of use by Lieutenant Danzer. It apparently had been the one used to disable the German tank across the Moselle.

Lieutenant Danzer senses the great tactical importance of preserving and capturing this last bridge across the Moselle for the advance of the division and the capture of the Epinal fortress. The brave officer is prompted to act without further orders and reinforcements. All depends on restoring the bridge to use and he decides to do this alone, believing that he can do it. In reply to those who would anxiously intervene he says, "It is time the bridge be cleared! I'll do it! I'll succeed if it costs my life!" He knew how dangerous it was. In order to acquaint the troops left on the far side of the Moselle with his plan, Lieutenant Danzer and one of the engineers recross the bridge at (A) and come to a corporal on their side of the Moselle. The latter's party of engineers and riflemen covering force are instructed by Lieutenant Danzer to cover him with machine-gun and rifle fire while he works on bridge (B). Lieutenant Danzer and his engineer then take an old, light delivery truck and again cross the Moselle, and retrace their former route. The engineer gets out at the market place (F) and the lieutenant proceeds toward the bridge, with the car, driving right up to the barricade of mines.

He leaps from the car and begins to tear up the pavement as fast as possible, and working from left to right lying down at times, at times kneeling, as he works, cutting the fuses, digging out the mines and tossing them in a high arc over the railings of the 10-meter wide bridge into the Moselle. In the meantime, the enemy has noticed him and opened fire on him. From our own side we are trying to beat down the enemy. Breathlessly our men watch the brave

lieutenant who calmly goes on with his work on the bridge. He has not yet dug out all the mines when he suddenly seizes his throat. Field glasses reveal he is bleeding. He signals that he is wounded.

As developed later, he had been shot through the throat from in front. In spite of this, however, he continues to dig up the mines and, as if by a miracle, he finishes despite the wound. He runs back to his comrades. On the way he stumbles over a wire, but is quickly back on his feet. All who are witnesses of this feat believe it to be accomplished. But, just as he reaches the end of the bridge he suddenly throws his arms into the air and falls again. From a cellar on the enemy's side another bullet has struck him. The engineer closest to him hurries to him. With the help of a motorcycle dispatch rider of the rifle troops, he takes him out of reach of enemy fire. Lieutenant Danzer is suffering from a severe stomach wound. In spite of his severe wounds, his first words are: "The main thing is that I cleared the bridge so that the division may advance." On the very same day, Lieutenant Danzer was recommended for the Knights Cross in addition to the Iron Cross. But it cannot be conferred on him now, as he died the following day of his severe wounds. Once before Lieutenant Danzer had distinguished himself with a similar feat. On the canal de le Bassée near St. Omer, he protected a bridge that was about to be blown up by his own personal intervention and in spite of enemy opposition removed the detonating conductors and captured the enemy detachment who were attempting to destroy the bridge. He received the Iron Cross (I) for this.

Lieutenant Danzer, born in Vienna, went from the Austrian Army to the German Army in 1938. He had already associated himself with the "great German idea" and bore a medal for the remembrance of the 13th of March, 1938. He was happy in the post of a German officer and fought with all his heart for his Führer and Greater Germany.

From other sources, it is later learned that, soon after it crossed the bridge saved by Lieutenant Danzer, this division took 8,000 prisoners.—EDITOR.

General Wavell on the Training of the Army for War

[Taken from a lecture given by Brigadier General A. P. Wavell in February 1933, entitled "The Training of the Army for War," as published in the May 1933 *Journal of the Royal United Service Institution.*]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

(It is interesting to read what a man like General Wavell thought about training in 1933, long before he became a great leader and when he was practically unknown.—EDITOR.)

General Wavell states that in compiling this lecture he has sought and taken advice from several of the real trainers of infantry battalion commanders. He has always regarded the battalion commander as a gamekeeper, who rears the birds, trains the beaters, breaks the dogs, and kills off the vermin; commanders or better represent the guns who come out in the autumn, shoot—or miss—the birds, and criticise the sport. The gamekeeper is the man who really knows the difficulties and possibilities. So far as training is concerned, General Wavell holds that it is a positive advantage to have to train simply "for war" and that to train "for *a* war" is a danger because that particular war never happens; it certainly did not in 1914—neither for the French nor for the British; and so much of the latter's training since 1919 has been dulled and stultified by training for *a* war—the late war, which was almost entirely a siege war and the worst of training, for infantry in all events. Let us therefore shake the last of the Flanders mud out of our minds, and concentrate on the essentials of training "for war," that is for "any war."

He is, by the way, proposing to train real infantry, not mere "barrage followers" and "moppers-up" on the pattern of some short-service continental infantry, who will apparently be content in attack to act simply as scavengers to their artillery or as jackals to their tanks. Such foot-soldiers require little more than parade discipline, a moderate degree of physical fitness, and skill in the use of their weapons. It is not of this sort of "jerry-built" foot-soldier that he speaks. The finished article that he has in mind will be perfectly capable of stalking machine guns, of overcoming a hastily organized defense by infiltration, and of penetrating even an organized defense without overwhelming artillery support; in the encouraging words of a recent Training Memorandum, "formidable fighting men—fit, active, inquisitive and offensive—confident of making ground with their own weapons." It can be done, even in modern conditions. The infantry in Palestine, well trained and confident in themselves, showed this to the Turks; while some of the Dominion troops in France, with their freshness of mind and audacity, and the Germans of March, 1918, with their skilful determination, are other examples.

In speaking of discipline, he says that so far as the infantry soldier is concerned, the discipline, or spirit, now required of him in battle is not so much unquestioning obedience as that, where two or three are gathered together, there shall be courage and enterprise in them. He further states that every time two or more soldiers are marched under a lance-corporal to perform some duty that they should be perfectly capable to perform by themselves, something of their independence is destroyed—quite apart from wasting the time and blunting the edge of a perfectly good lance-corporal. And it is the action of the individual or small group of individuals that more and more decides the

course of the modern infantry battle—a very lonely and forlorn affair to the average infantryman.

He brings out a very interesting point with reference to physical fitness when he says there is little to say except that a rational dress and a rational load are essential if the infantryman is to take advantage of his fitness in battle; and that anything more than one-third of his own weight is not a rational load for a fighting man.

In dealing with "Battle-craft" he says that a well-known and enthusiastic infantry brigadier always phrases his requirements for the ideal infantryman as "athlete, sharpshooter, stalker." General Wavell feels inclined to put his demands on a lower plane and to say that the qualities of a successful poacher, cat-burglar and gunman would content him. The infantry brigadier's ideal has moral qualities that his (General Wavell), he fears would not possess; and General Wavell's definition is deliberately meant to call attention to the value of low cunning in war. Certainly the knowledge and practice of battle-craft, i.e., commonsense or low cunning, is the weak point of the infantryman at present. We are unbuttoning his collar, let us also try to unbutton his mind.

That which he has to say about officers I will quote verbatim:

"The officer must, of course, have the knowledge and qualities of a leader, which are defined in the text-books; these, I think, we all know well and recognize. But he must also, as our Training and Manoeuvre Regulations wisely enjoin, have a broad outlook and wide general education; and this is where the average officer at present is apt to fail. The new system of education at the Royal Military College and at the Royal Military Academy will undoubtedly tend to eliminate this weakness, if the little grain of mustard seed implanted there is kept watered during early military life, and weeded later on.

"Training and Manoeuvre Regulations, in amendments issued last May, lay down 'an understanding of the psychology of their fellow-citizens' as essential for a commander. When I read these amendments, I was reminded of a friend and fellow-student at the Staff College, who had about the broadest and most original outlook of any soldier I have met —he unfortunately fell early in the war. He devoted several pages of the memorandum or 'Memoir,' which was then the chief work of the final period at the Staff College, to a recommendation that there should be established at the War Office a branch of the Intelligence Directorate to study ourselves, our national characteristics and our reactions as a nation to military matters. He wrote, with justice as it turned out, that whereas the knowledge accumulated at the War Office of foreign armies and foreign nations was exhaustive, we had no one whose business it was to study the psychology of our own citizens. His ideas were brushed aside by the teachers as a fantasy. But I have often thought what mistakes, miscalculations and misjudgments and how much effort and money might have been saved in the War years, had we had before 1914 such a section in the Intelligence. And would it not be worth while to have such a section now? I can see much useful work for a branch whose task it would be to study means for bringing the army into closer relations with civil life. It may be said that the Committee of Imperial Defence is the body for co-ordinating relations between the Services and the civilians; but it does not do the work I have in mind for this section at the War Office; work which should exercise a very close influence on training. My friend was also a great advocate of the study of the psychology of the soldier in battle, a subject which is not often thought of by the average officer, but the importance of which increases as the experience of war recedes. We have a manual on 'Animal Management;' is not 'Man Management' just as important?

* * * * * * *

"I have always felt that there is room for some sort of association—not necessarily official—to assist officers to spend their leisure profitably to themselves and to their profession. In the profession of an officer there is, still, more leisure granted than in any other; but the number of those who can afford the usual amusements of the leisured classes for even two months in the year is limited. Yet there are any number of means of spending a valuable and interesting holiday at little expense, if officers—and here I speak of course mainly of young officers not yet set in their habits—could find them or be introduced to them; and these should, at the same time, prove the means whereby officers might acquire that 'understanding of the psychology of their fellow-citizens,' which is enjoined by the Regulations. Walking or climbing tours, travel—possibly by tramp steamer—to places outside the ordinary tourists' routes, or service in one of these many associations that in this country concern themselves with the welfare of the nation at large, are possibilities that suggest themselves. I know that any suggestion of interference with or direction of an officers' leisure will sound anathema to many. But I do feel that many officers would welcome an organization that could suggest directions for their energies during their leisure and spare their purse. I can remember myself how I welcomed an introduction to skiing in the Alps over twenty years ago, before it had become either 'Tatlerized' or commercialized.

"I also suggest that every effort should be made to direct the attention of all officers to the air and to flying as a sport. I can conceive of no pursuit, not even excepting hunting, better calculated to develop the qualities we require in an officer—resource, nerve, quick decision and an eye for country—than flying. It is not even now entirely out of reach as a sport. I know of several infantry officers and of Cadets at the R.M.C. who have taken it up as their hobby; and the new 8 h.p. motorcycle engine aeroplane may soon make it even more accessible.

"So much in the way of general suggestion as to what we should aim at in the education of officer and man. It can really be summed up in a single phrase, 'mobility of mind and mobility of body.' And remember that the ideal officer must be afraid of nothing—not even of a new idea."

In dealing with young officers, he says there is another item that he is sure must be fitted in somewhere; and that is a short tactical and administrative course. The object of this course should be to interest the youngster in the theoretical side of his profession, outside purely regimental soldiering, to encourage him to study and to study on the right lines. Unless this is done early in his career, and the spark lit at Sandhurst—often a feeble one—is fanned while it is

still alight, interest in book learning and the broader aspects of soldiering may die altogether.

General Wavell believes that any officer of over five years' service should be reported on for his fitness or otherwise to command a company on service; after fifteen years' service for his fitness or otherwise to command a battalion; and after twenty years' service for his fitness to command a brigade in the field.

General Wavell refers to the question of exchange of officers between arms, a hardy annual which causes a considerable amount of correspondence each year. In theory, many such exchanges should be made; in practice, owing to the matter being left mainly to voluntary arrangement, it does not happen as often as it might. He suggests that, if these exchanges are considered of value, as they undoubtedly are, they should be ordered by the War Office, who must name the individuals to be exchanged from lists submitted by Commands, in exactly the same way as courses at the Senior Officers' and other schools are ordered; also that exchanges with the Royal Army Service Corps be included.

Regarding training he says that to hope that an officer will lead in war the men he has trained in peace is even more absurd. The most superficial inquiry into what happens on mobilization will prove that units go to war with practically new companies—officers and men. In war, in fact, a part of the officer cadre will be engaged in training men they will not lead in the field, while the remainder will be leading men whom they have not trained.

Yet time and effort are still wasted and the hearts of the enthusiastic broken, by trying to carry out training during this education period with platoons and companies that are barely skeleton. The remedy is to pool all the riflemen in a battalion, from 1st January to about middle of July, and train them in a "rifle wing." General Wavell states that he has been given permission to do this as an experiment with his brigade this year. These men will, of course, be administered and paid in, and play games for, their several companies; but for training they are definitely to be handed over to the rifle wing commander and his assistants. The battalion is then organized for training into machine gun company, rifle wing, and specialists.

German Tactics in their Aerial Attacks on London

[From an article by Colonel N. Zhuravlew, in *Krasnaya Zvyezda*, 31 December 1940. Translated from the Russian in the Translation Section, the Army War College, Washington, D. C.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

The air attacks on London afford a good example of the tactical forms modern aviation may assume in operations against large administrative and industrial centers.

To reach London in daylight, German aviation was required to overcome resistance of British pursuit craft disposed at the approaches to the capital. The Germans endeavored to crush the British pursuit aircraft at their airdromes. The British command, however, succeeded in providing its aircraft in due time with sufficient airfields and landing fields to insure the proper maneuver of their aircraft on the ground. As a consequence, the German raids on the British airdromes failed in their mission.

The Germans attempted also to facilitate their approach to London by staging aerial demonstrations against a number of points in South and Southeast England, hoping to divert the British pursuit aviation from approaches to the capital. This tactical method, however, also failed to produce satisfactory results: The British command would not disperse its pursuit craft or divert them for the protection of secondary areas.

The German air forces delivered their daytime raids on London with the aid of mixed groups. These included power-dive bombers of the "Junker-87" type or the fast "Dornier-17" bombers and the "Messerschmitt-110" and "Messerschmitt-109" pursuit craft. The mixed group ordinarily comprised 3 or 4 bombardment squadrons of nine airplanes each and 2 or more pursuit squadrons.

Practical experience demonstrated the expediency of this method. At the same time, however, it has shown that where the adversary is in possession of a sufficient number of pursuit craft, the bombardment craft of the attacker are far from being secure against attack by the hostile pursuit aircraft. Receiving timely information from the observation posts of the appearance of hostile airplanes, the defender is in a position to call out and to have in the air one and a half or twice the number of his own pursuit aircraft—and this was actually the case here.

In escorting the bombers, the single-place pursuit airplanes encountered such tactical obstacles as difficulty in withdrawing from combat and getting away from the hostile pursuit craft because of the fact that, in turning with their tail to the enemy, the single-place pursuit airplane becomes entirely defenseless. The two-place pursuit craft of the "Messerschmitt-110" type were tactically more satisfactory in escorting their bombers. These, however, were incapable of the full protection of their bombers against attack by the hostile pursuit craft.

In a word, the Germans found it impossible to overcome completely the action of the British pursuit craft that were massed at the approaches to London and, not desiring to endure heavy losses in massed daytime attacks on the British capital, resorted to night raids.

Practical experience of aerial engagements during the mass aerial attacks on London has shown that the pursuit craft are capable of attacking the modern fast bombers only from the rear, and this at close range only. Crosswise and frontal attacks are practically impossible because of the fact that the machine-gun fire at long range, owing to the great

dispersion of fire, has little effectiveness, and at close range, in view of the great speed of the airplanes, is almost impossible. Hence machine-gun fire in aerial engagements is opened at a range of 250 to 300 meters, and frequently at not more than 200 meters. However, even though the rear part of the bomber is less protected, the bombardment group, proceeding in close formation, is quite capable of producing sufficiently strong fire protection from the rear so that the pursuit craft, in the case of attacks at close range, will be subjected to serious losses.

The Germans endeavored to overcome the fire of hostile antiaircraft artillery weapons by two methods: By attacks on their battery positions and by a dispersion of the combat formations of their bombardment aviation. Experience failed to justify these methods, and the German air service increased its altitude of flight during aerial attacks. Even the German night raids are now being undertaken at altitudes of six to seven thousand meters.

The British pursuit aviation and antiaircraft artillery concentrated in the London area, proved quite effective in daytime action. The Germans, however, unwilling to abandon completely their daytime raids on the British capital, began utilizing their two-place "Messerschmitt-110" pursuit craft on bombardment missions. They possess powerful armament and great speed, and experience less difficulty in overcoming the action of the British in their defense against aerial attacks. The tactical importance of the daytime bombardment attacks carried out by these aircraft consists mainly of the fact that it impedes the work of restoration (especially the extinguishing of fires) and starts fires by which night bombers locate their objectives.

The tactics of German aviation in night operations is characterized by the concentrated attack. There were nights, for example, in which as many as five hundred airplanes raided London.

Practical experience has shown the night raids to be far less hazardous than the daytime attacks, though these demand particular skill in the handling of aircraft without the aid of ground orientation features. The Germans execute their night raids by echelons consisting of a score or more airplanes each. To provide maximum safety during flight, each echelon is assigned its own line and precise altitude of flight. The actual raid is delivered not by all echelons simultaneously but by small groups of planes of one or two elements each. This extends the duration of the raids.

In order to enhance the accuracy of their bombardment at night, the Germans usually illuminate their bombardment objectives. They send out special "illuminating planes," which fly at low altitude, and somewhat in advance of the combat groups, and drop illumination bombs over attack objectives. More protracted illumination is provided mainly by starting conflagrations. Incendiary bombs are dropped by the first echelons of the night raiders.

The experience of the raids on London shows that the crushing of a hostile air force by the destruction of hostile airdromes where the enemy has at his disposal a more or less properly developed airdrome system, and where he is in possession of sufficient means for restoration of losses—is a rather difficult matter. This is true, moreover, even where the attacker possesses a relative superiority of forces over the enemy. The neutralization of antiaircraft artillery established on fortified defense positions and equipped with means of defense against low-flying and dive-bombing craft is even more difficult of accomplishment.

The protection of bombers with the aid of escorting pursuit craft in daytime raids still remains an unsolved problem. The matter of determining the proper proportion of pursuit and bombardment craft in mixed aircraft groups during daytime raids on London has proved difficult.

The ratio of 2:1 employed in the Spanish conflict fails in the action against the British.

Nor did the Germans find an effective method for the penetration in daytime of the screen of pursuit aircraft situated at the approaches to their attack objectives. If this proved so difficult of achievement where the bombardment objective was situated a distance of 120 to 150 kilometers (about 75 to 95 miles) behind the advance line of observation posts, the difficulties will be even greater where the bombardment objectives will be situated several hundred kilometers from the front lines.

The two-place twin-motor pursuit airplane proved itself more suitable for daytime bombings which, being a fighter airplane and possessing high ceiling and great speed, experiences relatively small difficulty in overcoming all modern means of antiaircraft defense. Important results, however, may be achieved only by the employment of large quantities of these pursuit craft, since the load which each of these may carry is rather insignificant.

The most effective means in action against bombardment craft flying in close formation is the pursuit plane armed with cannon. It is capable of firing at such range as to remain beyond the reach of the machine-gun fire of the bombers. Though the bombers may suffer some damage from the cannon fire of the pursuit craft, yet, considering the meager effectiveness of the small-caliber shells and the limited reserve of these carried by the pursuit craft, it will not be advisable for the bombers to assume dispersed formations. In such event, these will lose their fire contact among themselves and become easy prey for the pursuit craft in subsequent attacks.

Aerial engagements with the aid of machine-gun fire are conducted at close range, not to exceed 250 to 300 meters. Action at greater range may be resorted to only where the aircraft are equipped with cannon. The best armed airplane so far has proved to be the machine-gun and cannon equipped pursuit plane.

In the case of the swift bomber, threat of pursuit craft machine guns is only from one direction—40 degrees in the rear hemisphere—primarily against the lower portions of the bombers.

The modern night antiaircraft defense is suffering from a variety of important deficiencies; as a consequence, night raids have proven relatively safe. The Germans have transferred their efforts to night undertakings.

The value of the experience to be derived from the raids on London is exceptionally great, inasmuch as it has permitted the verification of a series of theoretical assumptions. Some of these may be now corrected, others as thoroughly refuted. Of equally vital importance is this experience in the construction of airplanes and motors.

Independent Air Action

[From *The Aeroplane* (Great Britain), 31 January 1941.]
Condensed by LIEUTENANT J. J. GLEASON, *Infantry*

Successful defence against air attack has driven the Nazis back upon their original faith in the alliance of the air arm with one or both of the other arms. Their own offensives in Poland, Norway and France had already confirmed them in their belief. The sweeping success of the British in Libya has strengthened their theory of combined warfare. The failure of the Luftwaffe, operating alone, to bring results proportionate to the effort expended has convinced them that the crushing blow and the victorious thrust must be made in concert. Air power for German purposes must be made to serve as destroyers to the troopships, as lorries for the shock troops, as the artillery barrage to cut a path for the tanks and as a protection against enemy air interference.

Air power in that line of thought is concerned only with local superiority. At a particular place and time, it is required to secure freedom of action for the Army and Navy, and to add such offensive strokes as may contribute to the progress of the one and the maritime control of the other. In the recent formation of the Army Co-operation Command and in the expansion of the Coastal Command, Great Britain is seen to be striving to preserve her earlier conception of the functions of Air Power while she meets the demand for particular applications of it. She seeks still to set aside parts of the Royal Air Force for work in combined operations, but to leave the greater part of the Service free for devotion to independent operations. Where the Luftwaffe has failed, Great Britain shows by her policy she believes the R. A. F. can succeed. The bombers will still be capable of diversion to invasion ports and submarine bases. The fighters will remain available for work with the Army as over France and Belgium. But the whole Force, when the defensive is merged in an offensive, will have an opportunity to develop its own strategy.

In one sense, all air action is a form of preparation for subsequent military action. The munitions of war are better destroyed at their source than at the place where they are used for military ends. Communications are as well cut near the dumps as between railhead and the front. Everything of military or naval value which can be denied to the enemy before he can use it makes the way easier for those who would dispute his right to enjoy captured territory or to do damage at sea. Yet in considering modern war, the old methods of securing a verdict are in conflict with the new weapons now available in its cause. War has but one basic end—the imposition of the will of one nation on another. The traditional method of achieving that end is the occupation of territory and the compulsion of its people by controlling not only the machinery of government but the machinery of every-day life. An army in occupation can restrict civilian activity, even to the point of withholding the necessities of life, until its demands are met. An air force which had sufficiently established its supremacy might be able to exercise similar restrictions without being in physical occupation.

The independent method has not yet been tried. Great Britain is not yet strong enough to try it and must pass through another phase of the defence before she can expect to be strong enough, but there is every reason to suppose that she looks forward to the ultimate reduction of Germany to a condition of impotence by means of air action. Given success in that aim, the military side of the business need be little more than formal invasion for the purpose of restoring broken governments, dealing with remnants of opposition and insisting on the acceptance of terms.

Time is the particular commodity needed by a big air force to carry out such a plan. Time Germany cannot spare, even if she could hope to win the air superiority over Great Britain which would allow her to try it. There should be ample time, when the British forces have been built up, for the R. A. F. to undertake the smashing not only of essential services in the principle German towns but of the means of communication between one and another, and between them and their armed forces, wherever they may be. These things must be destroyed again as soon as they are repaired. The complicated ways of life of industrial communities must be broken and kept broken, so that activity is stopped and life itself becomes a problem. In this war of machines, the destruction of life is a poor objective compared with dislocation of the central machinery which feeds and gives vitality to the war-making. This War may be won by Air Power well inside the enemy's frontiers, not by terrorising civilian populations but by depriving a highly developed nation of its arteries—the means of communication.

The Preparation and Execution of Tactical Exercises of the Squad, Platoon and Company

[From an article by Lieutenant Colonel Klockenbring, in *Militär-Wochenblatt*, 13 December 1940. Translated from the German in the Translation Section, the Army War College, Washington, D.C.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

A. General Principles

A tactical exercise serves its purpose only if the directing officer prepares it carefully in the form of a situation in which the enemy is represented and umpires are furnished; if it is executed with firmness and force as one coherent operation; and if it is followed by a thorough critique in which all mistakes are discussed.

It is a fallacy to drill into the troops certain combat missions; to present them as "standard solutions"; and to declare such solutions to be the only correct ones. Care must be taken that combat missions are not executed according to hard and fast rules. Almost any situation permits of more than one solution. The main thing is the manner in which the officer commanding the troops carries out the decisions of the director of the exercise; and that he actually leads his troops.

Training of leaders constitutes a vital factor in the preparation of a tactical exercise. Hence missions should be selected which require the leaders, when operating outside of the framework of their respective units, to make independent decisions and to learn to express them in brief, clear orders. Furthermore, the combat training of small units, up to the company, must stress the importance of combat-like conduct of the troops during the execution of an exercise. Exploitation of the ground, moving into position, taking aim, occupation of alternate positions, position changes, advances by bounds, exploitation of the fire effect of heavy weapons—all are factors which call for rigid supervision. The soldier must apply in a practical and correct manner that which he has learned in the school of the individual soldier.

B. The Preparation and Execution of Combat Missions

(1) *The director of the exercise.*—The selection of the officer directing the exercise must be guided exclusively by his personality and professional ability. As a rule, the platoon commander directs the exercises of his squads and platoon, while the company commander directs those of his platoons and company. The officer directing the exercise serves as the instructor. Therefore, when inexperienced platoon leaders are to be trained or the company is to try out some new principle, the company commander may even lead squads and platoons in exercises. However, in no case may the officer directing the exercise be the one who commands the troops during the exercise.

In designating the leaders, care must be taken not to choose only the best officers and noncommissioned officers, for fear that one or the other may be withdrawn and assigned as director of the exercise or as an umpire. This is important, for replacements must be trained for all leader positions. Therefore, the most competent instructor must be selected to direct the exercise. Actual combat conditions may be met by removing leaders and replacing them by others who are not so well trained. A thorough preparation of the tactical exercise is essential. Other prerequisites for the instructive conduct of an exercise are: A brief written outline of the exercise prepared in the office with the aid of the map; and the improvement and perfection of the plan based on a thorough reconnaissance of the terrain.

(2) *The object of the exercise and the conformation of the ground* are two inseparable factors, inasmuch as the selection of the terrain depends upon the lesson which the exercise is to teach. The object of the exercise must be confined to the conduct of a definite "combat phase," such as the "occupation of departure positions," or the "occupation of departure positions and an 800-yard advance," or a "squad (platoon) on outpost," or a "penetration and preparation for pursuit" and so forth. The object of the exercise must conform to the terrain. The conformation of the ground must be accepted in its true state; and the object of the exercise must be achieved even in difficult terrain, by assuming realistic and logical fire actions (such as fire support by adjoining elements, heavy weapons fire and artillery fire). The director of the exercise must not be too particular in the selection of the terrain. Few terrains meet all of the demands of tactical training. In order to be prepared for actual combat, the troops must learn to make the best of any given terrain.

(3) *Representation and disposition of the enemy.*—Representation of the enemy may be omitted only if the object of the exercise does not call for the presence of hostile troops, or if the purpose can be achieved by the designation of umpires. That applies only to situations in which the opponent is assumed to be far removed, that is, the execution of a development and maneuvers conducted under hostile fire, the occupation of departure positions, the preparation of defensive positions and so forth. All other situations require representation of the enemy. The best method is to employ full-strength troops marked by distinctive hat bands. In small exercises, the opponent may be simulated by silhouette targets supplemented by a few riflemen and, perhaps, a machine gun. In any case, however, the enemy must be provided with blank cartridges. Simulation of the enemy by flags is an unsatisfactory method.

The enemy must be fitted into the hostile situation. Leaders and umpires for the opposing side must be designated without fail; and they must be carefully instructed on the ground, with regard to the plan of action and their functions. The leader of the enemy must be constantly on the alert and open fire on any unwarlike movements of the attacking troops. Both he and the umpire of the opponent

must keep written notes on observed mistakes and present them for the critique. It is highly advisable for the leader of the enemy, accompanied by all of his men and his umpire, to inspect the terrain prior to the exercise and form an estimate of the terrain.

(4) *Umpires, assistants to the umpires and their instructions.*—(a) The *umpires* are the most important assistants of the officer directing the exercises. They are noncommissioned officers whose function it is to observe the fire effect and, by assuming proper fire actions, to guide the exercise along the contemplated course. The umpires may be furnished assistants for the purpose of checking technical matters, such as sight setting, locking of the piece, aiming, range, firing and so forth. The director of the exercise serves also as chief umpire. Umpires and their assistants are marked by distinctive hat bands.

Above all umpires must lend the exercise the atmosphere and effect of actual combat and furnish substitutes for the absence of hostile fire effect. Unwarlike conduct on the part of the troops must be penalized by ruling them temporarily out of action; reemployed shortly, however, to prevent their lying around idle. In the case of platoon and company exercises, they may be ordered to trail the other troops in a body; or they may be employed as a squad or platoon in reserve, if the situation calls for it.

The fire actions assumed by the umpires must be logical, and above all, they must be feasible. The umpires must indicate clearly what areas are under fire of friendly or hostile artillery, infantry cannon, heavy machine guns and rifles. To make the assumed fire actions appear more realistic, umpires use detonators and flags, of which every company must have an ample supply. Umpires' duties are exacting. Only well trained noncommissioned officers and privates, first class, are selected as such.

During the exercise, umpires must conduct themselves the same as they would in actual combat. When issuing instructions, they must be in the same position as the troops and not disturb the scene of action by standing upright and so revealing to the enemy that the troops are approaching. The duties of an umpire call for agility and swiftness of movement. He must make notes of all mistakes to be taken up during the critique.

The following rule may be applied in the assignment of umpires:

Squad exercises:	1 umpire and, preferably, 1 assistant;	
Platoon exercises:	1 umpire for each squad:	3
	1 umpire with the platoon commander:	1
	Total:	4
Company exercises:	1 umpire with company headquarters:	1
	1 umpire for each platoon:	3
	Total:	4

In addition, 1 assistant to the umpire for each rifle squad.

Attached weapons, such as infantry cannon, AT gun, heavy machine gun and infantry mortar elements designate their own umpires (1 umpire for each platoon, and 1 assistant for each gun).

(b) The director and chief umpire of the exercise personally introduce the umpires to the terrain. All umpires and their assistants must be thoroughly informed in advance about the situation on both sides, the object of the exercise, the plan of action, the functions of umpires, the types of assumed fire actions, and so on. Otherwise, the result will be that the umpires move about idle or assume fire actions that are contrary to the object of the exercise. Umpires, in conformity with the instructions of the officer directing the exercise, decide independently whether to penalize the leaders and troops.

(5) The director of the exercise in all cases announces the *initial situation* to the assembled unit. It is advisable to repeat the situation and, especially, the mission briefly, for it is essential that all participants be acquainted with those facts. While the situation description must be brief, it must cover all essential factors so that all concerned understand. The description opens with the necessary information about the enemy. In situations involving contact with the enemy, this must include information about the areas covered by hostile heavy machine-gun, artillery and rifle fire. Data about the enemy may be furnished in the form of reconnaissance reports. Next follows information about the friendly forces, usually beginning with the next higher unit. The director indicates the areas under friendly fire; artillery, infantry cannon, heavy machine guns and other supporting weapons. In a tactical exercise where both flanks rest on adjoining units, it is necessary to outline further the situation of the adjoining squads, platoon or companies, as well as to designate the zones of the individual squads, platoons and companies. The director announces plainly the mission of the squad, platoon, or company. It is best to express the mission in the form of clear, but concise, orders, issued by the next higher commander. Thus, the platoon commander may order as follows: "Squad X has the mission of securing the company while the latter is taking up a departure position along the railroad track"; or "combat mission for Squad X: Occupation of the thicket in front of us" and so forth.

Represented troops are simulated by a few men or blue flags carried by bearer. They advance with the troops as the action progresses.

Finally, the director of the exercise designates the *order of battle* and the line which the troops or their forward elements have gained. He explains briefly, also, the situation in the air, as for instance: "At X hour (hour when the exercise starts) an element of friendly (or hostile) reconnaissance aircraft, flying at an altitude of 10,000 feet, will cross our (or the hostile) lines in . . . direction." Depending upon the object of the exercise, he may also indicate the situation with regard to ammunition; for instance, if it is to be moved up during the action.

(6) *Commencement of the exercise.*—Upon announcing the situation, the director usually directs the commander of the troops to assume a formation corresponding to the initial situation and to execute those movements under normal conditions. He makes whatever corrections are in order and orders: "War conditions will commence now"; or has the bugler sound "Forward, March." The troops then move out under combat conditions and the enemy opens fire. In

that manner, each element occupies its respective zone of advance.

(7) *The course of the action* stands and falls with the officer directing it. If the exercise fails to develop according to plans, the fault lies not with the troops, but with the director of the exercise. It is a mistake to hasten the exercise, to "race through it." The director and chief umpire must make sure that the exercise adheres to the prescribed course, by seeing to it that the other umpires assume the friendly and hostile fire actions in accordance with his instructions. The umpires must insist that the exercise is conducted under actual combat conditions; that the leaders are granted sufficient time to make decisions and issue orders; and that the troops are given time to execute these orders. A hasty attack is out of the question in modern warfare. Heavy weapons require time to go into action as well as to open fire on the enemy and put him out of action. Excessive speed in the execution of an exercise usually results in bungling—and neither the officers nor the rank and file benefit by it.

The director must take prompt action, either personally or through the umpires, wherever mistakes are observed. In the event of major blunders he has the bugler sound "halt" and discusses the mistakes, before resuming the exercise. The director focuses his attention, above all, on the complete achievement of the object of the exercise. "Recall" must not be sounded until that is accomplished.

(8) Every exercise must be followed by a *critique*. The critique is conducted by the director. While the personnel engaged on both sides is assembling for the critique, the director holds a brief discussion with the leader of the enemy and the umpires on the notes they have prepared during the exercise. In the case of company, platoon, or squad exercises, the entire unit assembles for the critique. The discussion covers approximately the following subjects: The object of the exercise; a brief recapitulation of the situation on both sides, emphasizing the combat missions; the disposition and initial situation of the enemy and the training unit; the conduct of the leaders on both sides, their decisions, orders and demonstration of leadership; the influence of the terrain; the conduct of the troops; the employment and effect of the heavy weapons; and mistakes due to faulty training, reference being made to pertinent Training Regulations. A brief summary concludes with a final estimate, stating whether the object of the exercise has been achieved. Praise and criticism must be carefully weighed at the critique; pure praise is as detrimental as pure criticism. Brief recognition raises the self-reliance of the personnel, especially that of the commanders. On the other hand, tactical errors and their consequences must be discussed in detail. Special emphasis must be placed on the influence of the terrain and the vital importance of exploiting the terrain.

C. Conclusion.

The factors pointed out in the foregoing, properly applied, govern also the preparation and execution of small and large-scale exercises of heavy weapon elements. When heavy weapon elements are atttached for squad, platoon, and company exercises—which should be frequent—they require special attention, with regard to the effect of their fire and their teamwork with the infantry. The value of such tactical exercises, as discussed above, may be enhanced further at the sand table after the exercise. This method is recommended especially for inclusion in the winter training schedule.

The March and Meeting Engagement of Motorized Infantry

[From an article by Lieutenant Colonel S. Kosak, Russian Army, in *Krasnaya Zvyzeda*, 22 November 1940. Translated from the Russian in the Translation Section, the Army War College, Washington D. C.]

The history of war shows that most of the decisive battles were won by mobile forces. At present, along with the cavalry and tanks, the most mobile type of force is the motorized infantry. Having come into being after the first World War in the shape of battalions and brigades employed in the support of tank forces, motorized infantry at the present time comprises entire units, which often exert a decisive influence on the outcome of battles.

Motorized and tank troops, inserted into a penetration, cut to pieces resisting units, seize vital crossings and important towns, and attack retreating hostile forces from the rear. More often the motorized infantry follows the tanks and consolidates the ground gained by them. In terrain difficult to traverse, the motorized infantry is sent ahead and, together with auxiliary and engineer forces, prepares the way for the tanks.

The infantry—including both foot and motorized units—following in rear thoroughly clear and consolidate the ground thus gained. In order to afford timely support to the mechanized units, the infantry divisions must cover 50 to 60 kilometers (31 to 37 miles) per day, and quite often it will be necessary to temporarily motorize the foot infantry division. Utilization of the motorized foot infantry thus temporarily motorized and of infantry units permanently (organically) motorized, enhances the mobility of the undertaking, impedes the organization on the part of a retreating enemy of a proper defense or efforts to bring up fresh reserves for employment in counterattacks.

Judging from the information gleaned from the military press, the modern organization of the permanently motorized infantry in the armies abroad is as follows: The motorized infantry is organized into brigades forming an integral part of mechanized units, and into special divisions, including tanks, artillery and regularly assigned motor transport organizations. In addition, there are provisional motorized

divisions which are assigned motor equipment for the execution of certain special missions.

A particular feature of motorized infantry carried on caterpillar, armor-protected transport vehicles is that these are invulnerable to rifle and machine-gun fire and are capable of movement behind tanks on the battlefield wherever there is no hostile artillery present. The infantry of independent motorized units always detruck before entering into action, leaving their unarmored transport vehicles under the nearest cover. Overcoming the hostile resistance, the infantry once more resumes its movement on the motor transport vehicles, covering 20 to 30 kilometers (12 to 18 miles) per hour in daytime. Over automobile roads a speed of 40 kilometers (25 miles) per hour is quite feasible. Forced marches of 250 to 300 kilometers (about 155 to 185 miles) per day may readily be accomplished, travelling 12 hours and spending 4 to 6 hours at halts to inspect and repair equipment and feed the men. Best results are obtained on a march where two drivers accustomed to long marches are employed on each vehicle.

When the motorized infantry engages in combat, its rate of speed is of course retarded—but it still maintains considerable speed. Thus, German motorized and tank units in the war with Poland covered about 300 kilometers (185 miles), with fighting in the course of eight or nine days, while covering 200 kilometers (about 125 miles) in five days in Belgium and Northern France.

Motorized infantry, supported by other types of forces, is capable of breaking through light field fortifications, of gaining the rear of the enemy and cutting off his line of retreat. The surprise effect in the delivery of the attack by motorized infantry with tanks, in the case of mobile warfare on a wide front, permits the elimination of extensive artillery preparations. Mass employment of aircraft on the battlefield is substituted therefor. Here the motorized infantry may be utilized to widen created gaps in the defense positions and to infiltrate into the depth of the dispositions of the hostile defense positions.

Thus, among the positive combat qualities of the motorized infantry are the following: High strategical and tactical mobility; great fire and striking power; the ability to occupy and hold ground independently. Among the negative aspects are: Great dependence on roads; susceptibility to barriers; bulkiness of motor parks. The great length of columns renders the motorized infantry vulnerable to attack by hostile tanks and aircraft. As we know, these weak features were taken advantage of by the governmental forces in Spain in March, 1937 in the defeat of the Italian motorized corps at Guadalajara, which comprised thousands of motor vehicles and a large number of tanks. In order to repel a surprise hostile tank or aviation attack, the columns are well equipped with antitank and antiaircraft means of defense and are supported by aviation.

Motorized infantry may be employed in any action. The best results, however, may be expected of it in those situations where the motorized organizations will be capable of action in massed formation and of the delivery of attacks with surprise effect, utilizing properly their great mobility. Situations of this nature will more frequently be encountered in meeting engagements, the organization of which must be well provided for.

On the march, the tanks proceed in advance of or on the flanks of the motorized column, always in readiness to pave the way for the infantry. Where action is anticipated in areas that are difficult of approach by tank forces, higher commanders move up their motorized infantry and engineers in such areas. In the circumstances that type of force is sent ahead which will be the first to enter into action. There may be situations in which tanks will follow the infantry. The experience of the war in the West has shown that the motorized division usually marches over two or three roads, with the length of columns of 15 to 20 kilometers (about 9 to 12 miles).

In order to execute an operation in considerable depth while at the same time insuring the continuous action of the motorized infantry, it is essential to undertake a minute reconnaissance of the terrain and forces of the enemy. In adopting plans for an attack, the commander must possess sufficiently complete reconnaissance data. The reconnaissance must be undertaken in machines possessing great mobility: Fast tanks, armored cars, motorcycles. Considerable importance is assumed in the circumstances by the aviation which, aside from aerial reconnaissance, may guide the ground forces to the enemy, protect flanks, cooperate with advance units.

The principal object in the attack is to anticipate the enemy in deployment and to gain the hostile flanks and rear, with a view to the complete envelopment and destruction of the enemy. This is accomplished by a double envelopment, or by driving the enemy against some natural barrier (water barrier, swamp).

The leading elements, usually made up of motorcycle detachments, are sent ahead for the capture and maintenance of important points (bridges, defiles, crossings) before the main body of the unit can reach them. The distance of these from the column of the main forces is 60 to 90 minutes' march. Possessing considerable mobility and equipped with a large quantity of automatic weapons, the motorcycle detachments, operating in conjunction with air landing detachments, are capable of defending for a considerable period of time captured points and of holding off approaching forces of the enemy. The mobility of the leading elements enables them to anticipate the enemy in the seizure of favorable roads, crossings, defiles, etc. The reconnaissance elements and advance detachments must be familiar with the signals for calling out friendly combat aviation, and must be able to guide them to their targets.

The leading elements, in conjunction with the units of the advance security detachment of the column must secure for the commander of the units 60 to 90 minutes in which to receive information of the enemy, adopt plans and deploy the main forces in dismounted combat formations. They furthermore provide the commander an opportunity to undertake a brief reconnaissance and select suitable ground for the deployment of his forces.

In proportion as the motorized columns approach the area of the encounter, they disperse frontally and assume a preparatory formation, reducing the length of columns. Each of the columns, with a view to facilitating control in combat, divides itself into battalion and company echelons. This calls for a large number of parallel roads or trails and also complicates the matter of control during the march. At

the same time, however, it accelerates the march and facilitates the selection of points for detrucking the infantry, which will produce a situation favoring the prompt deployment of the entire unit.

From the start the tanks receive independent missions for the destruction of the hostile columns, and are utilized in the support of advance security detachments; subsequently they attack in conjunction with the infantry. The columns, receiving by radio and through liaison personnel, their missions, direction and line of departure preparatory to the attack, enter into action gradually or simultaneously (in accordance with the particular requirements of the situation). A simultaneous attack with the main tank and infantry forces, supported by aviation, constitutes the best form of attack of motorized forces. In order to accomplish this, the maneuver of the columns on the flank and rear of the enemy is continued as long as the fire of the enemy will permit it.

The infantry must get out of its trucks beyond the effective range of hostile machine-gun fire, i.e., about one or two kilometers from the enemy. After detrucking the infantry immediately launches its attack in the wake of the tanks, supported by the artillery and its own weapons. At times the nature of the terrain will permit the unloading of small units closer to the enemy, when the transport equipment will at once be removed to the nearest cover. Motorized equipment is guarded by special detachments which maintain uninterrupted contact with their respective organizations. These detachments, together with the transport units, move up by bounds in rear of the advancing infantry. The second echelons may continue their movement during the attack on their transport vehicles and, where this is impracticable, they may leave their transport vehicles and attack in the wake of the first echelons.

While detrucking, the motorized infantry is most vulnerable to tank and aerial attacks. Because of this, the occupation of the line of departure should be properly covered by tank elements and artillery and by antitank and antiaircraft means of defense.

Motorized units usually attack with an assault group on a front of 3 to 4 kilometers. The assault group should comprise at least three-fourths of the entire infantry, tanks and artillery. An appropriate portion of the forces is maintained in reserve. A containing group will in some instances lead the hostile forces against tank elements maintained in ambush.

The moment it becomes apparent that the enemy is withdrawing from action, immediate steps are taken to impede his withdrawal. The motorized infantry, in conjunction with the tanks, utilizing parallel and lateral road, attack the disorganized enemy in flank and rear with the object of destroying his main forces. The transport equipment of the motorized infantry must keep up with the infantry as the latter advances during the battle, so that, in the event of necessity, it may facilitate the prompt entrucking of the infantry in pursuit of the enemy.

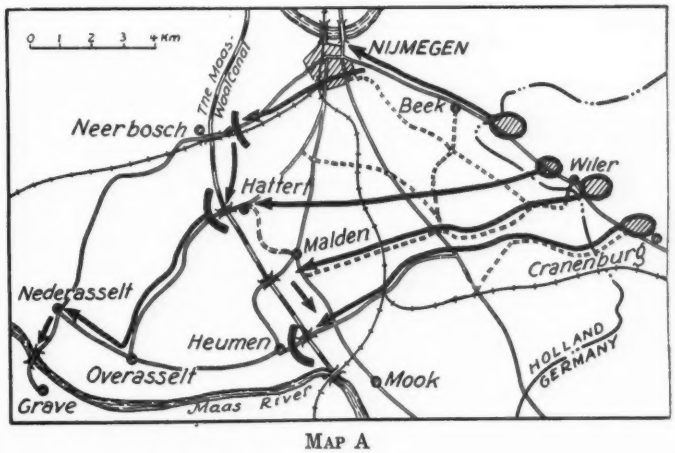
Motorized Detachment in Holland

["Motorizovanniy otryad v Gollandii," By Wim Brandt in *Militär-Wochenblatt*. Translated from the Russian by Lieutenant Joseph Dasher, ORC, from *Krasnaya Zvyezda*, 24 November 1940.]

The motorized detachment of the "SS" (Elite Guards), commanded by the author, was stationed on the Dutch border since February 1940.

On 9 May the state of emergency was unexpectedly declared. The reconnaissance detachment, together with a machine-gun battalion and one artillery battalion formed the "Grave Group." (See Map A) The mission of this group was the sudden capture of at least one bridge on the Maas-Waal Canal and then the capture of the bridge at Grave. For this purpose the detachment designated five shock groups. Each of these groups consisted of a rifle squad on motorcycles and two armored reconnaissance cars. One shock group was to advance towards the bridges across the Rhein (Waal) at Nijmegen, while the other groups (Nos. 1-4) were to move towards the canal bridges at Neerbosch, Hattert, Malden and Heumen. The shock group which was advancing on Neerbosch was followed by the balance of the reconnaissance detachment. The remaining shock groups were followed by one company from the machine-gun battalion. During the night the shock groups took up positions of readiness near the border.

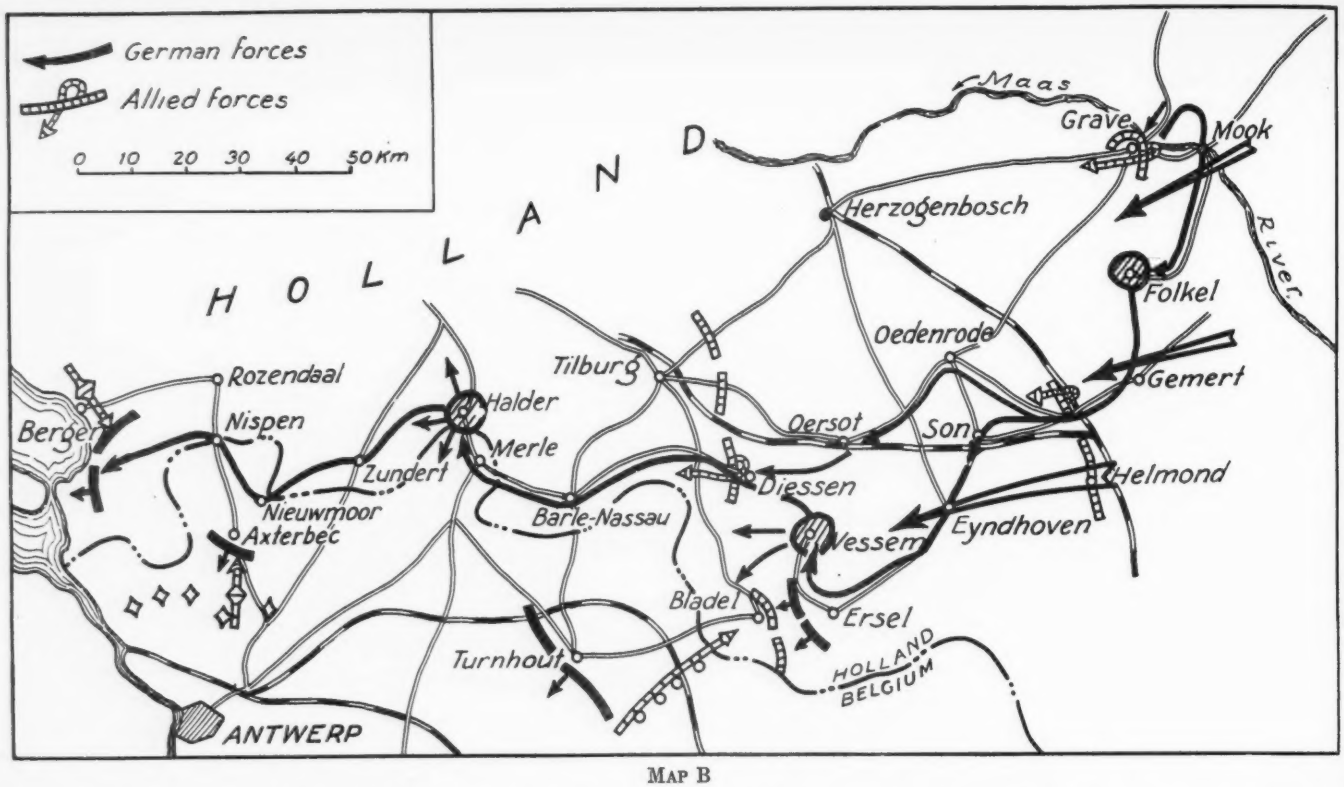
The state of emergency and the preparations for the offensive could not be kept unnoticed by the enemy. During



MAP A

the entire night blasts were heard on Dutch territory and many obstructions were placed, blocking the roads.

At 5:35 AM German forces crossed the borders and simultaneously strong German air force units flew into enemy territory. At first no resistance was met. There was only the sound of Dutch air raid warning sirens every-



MAP B

where. The shock groups, together with the advancing forces, began the search for passages through obstacles and for roads around them. Approximately at 7:00 AM the shock groups had reached their first objectives. In sight of the Nijmegen shock group the bridge at Nijmegen was blown up. The first shock group was already at a distance of 150 yards from the bridge at Neerbosch when the blast took place. Simultaneously the reinforced concrete fortifications on the western bank of the canal opened heavy fire. After sustaining light losses, this shock group took up positions and engaged the enemy. The bridge at Hattert was blown up inefficiently and the second shock group found itself under strong fire from the reinforced concrete fortifications. Aided by the fire from the armored car, an antitank gun was emplaced, after which the commander of the group attacked the bridge. Two men were killed and the group commander was wounded, but with 4 men he reached the opposite bank. Employing hand grenades they attacked the nearest reinforced concrete fortifications, in order to protect the crossing of the remaining personnel. By noon a fortification, five-eighths of a mile in length, was erected before the bridge and 100 prisoners were captured, together with much equipment.

The third shock group, after finding that the bridge at Malden was destroyed, continued its movement in the southerly direction and took part in the engagements at Heumen. Here the bridge was intact, but a raid intended to capture it was unsuccessful. Only toward the end of the day the commander of the third shock group succeeded in breaking across the bridge with two armored reconnaissance cars, silencing the reinforced concrete fortifications on the opposite side of the canal.

Unfortunately the command learned too late of the success achieved at Hattert, and thus the units belonging to the reconnaissance detachment, which were near Neerbosch, received only at about 9:00 PM the order to move through Hattert in the direction of Nederasselt, where they encountered but weak opposition and captured several hundred prisoners. The Maas (Meuse) river bridge near Grave was damaged by a blast, and the enemy was conducting machine-gun and antitank fire from the opposite bank. On the morning of 11 May the enemy was silenced by the fire of German machine guns and heavy grenades. (See Map B).

By this time an order was received to cease action and to move through Mook, placing themselves at the disposal of the commander of the "SS" division. In the afternoon, having crossed the canal at Mook, the motorized detachment reached Folkel, stopping there for the night. On the following day the detachment was given the mission to advance to Eyndhoven in order to protect the southern flank of the division. The detachment was proceeding slowly on crowded roads, over hastily repaired bridges, and as darkness fell continued to advance through Eyndhoven in the direction of Bladel. Near Ersel the detachment met the headquarters of an army division whose units were engaged against French motorized forces. The detachment then proceeded to Vessem, where it spent the rest of the night. At this time a part of the detachment, advancing in the westerly direction, encountered French motorcyclists with antitank guns at Diessen.

On 13 May the detachment dispatched several reconnaissance groups in westerly direction, but no enemy was sighted as far as the Belgian border. Towards night the detachment went to Halder. On the next day, 14 May, units of the "SS" division, which were advancing in the westerly direction, emerged north of Antwerp, reaching the coast in the vicinity of Bergen. Here too, during the day, came the reconnaissance detachment which took part in the three-day battles on the islands of the Zeeland province.

Battleship or Aircraft Carrier

[From an article in *The Aeroplane*, (Great Britain), 24 January 1941.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

Before the war began, no naval strategist would have admitted that, if airpower is ever matched against unsupported seapower, then new weapon will probably win. But, the assertion is one which most naval strategists feared they might one day have to allow. Hence the aircraft carriers of the British Navy, of the United States and of Japan. The decision of Italy to do without aircraft carriers was based on the assumption that land-based aeroplanes could be brought to the aid of her naval forces. Sicily, Sardinia, Libya and the Dodecanese Islands were to have done duty for the non-existent aircraft carriers. Where Italy failed, Germany now seeks to succeed.

The British have continuously expected air attacks against naval units in the Mediterranean. The presence of both the *Illustrious* and the *Eagle* in Mediterranean waters, which was revealed by the raid on Taranto, is evidence of the Navy's conviction that it would have to meet heavy air opposition. The development of the full weight of enemy assault has had to await the arrival of the Germans, but all that happened in the Sicilian Channel last week had been foreseen as a probability. Without aircraft carriers, the British Fleet could never have contemplated the convoying of merchant ships through the Mediterranean narrows. In the same way, the British Navy could never have hoped to contrive the evacuation of the British Expeditionary Force from Dunkirk without the protection of the Royal Air Force. Wherever the air threat appears, it must be met by air opposition, whether the occasion be a naval affair or operations by an army on land.

Power of manoeuvre and heavy concentrations of anti-aircraft fire are never sufficient to defeat a determined air attack. Those measures are all that a naval force, unsupported by air units, can take. They make the enemy's attack expensive in wasted bombs and in aeroplanes lost, but they do not preserve the ships from damage. The loss of the *Southampton* last week is a heavier blow to the British than the loss of even 50 bombers would be to the enemy. The prospect of such big returns makes the use of the air weapon particularly attractive to powers like Germany, which believe that the lack of seapower can be made good by superabundant airpower. It seems to promise the destruction of a big enough part of the opposing navy to remove the restrictions imposed by naval strength on the movement of merchant shipping and so not only to defeat blockade, but to ease the processes of supplying and reinforcing overseas land forces. German operations in the Mediterranean thus have a direct relation to projects for the invasion of Great Britain.

When the Navy must operate nearer to enemy than to British bases it must have its aeroplanes with it. It can never be as defenceless against air attack as the enemy would wish, while fighters can be put up from an aircraft carrier. Repeated attempts to destroy the aircraft carriers, at sea and in port, represent the enemy's confession that his theory is unlikely to work in the face of fighter defence. The aircraft carrier is the fundamental obstacle to the realisation of the strategy of air control. Its destruction is the first step in the process of imposing an air blockade. If it could be dealt with, then such naval vessels as could count on no defence by land-based aircraft could be destroyed when they came within range of the bombers. When their numbers had been sufficiently reduced, the enemy's navy would be released and the enemy's long-range bombers would give their undivided attention to merchant shipping in the more distant parts of the seas.

Even with the help of the Royal Air Force, the Navy will still have to rely on the air strength which sails with it. Antiaircraft ships on the German pattern are no real answer to air attack at sea. The British Navy, like every other navy which ever expects to approach enemy air bases, must have fighters of the highest performance, and as heavily armed as possible.

The theory that the best form of defence is attack must be restricted to the particular element in which an arm is intended to operate. Attack by naval aircraft on units of an enemy fleet is an appropriate use of a navy's airpower. Attack by naval aircraft on the enemy air bases, from which it might be attacked, is beyond the true scope of naval action. A navy's sea-borne aeroplanes are not numerous enough nor heavy enough to undertake that duty. The air arm proper must undertake such preventative measures. Upon the naval arm devolves the duty of protecting itself by air action against such air attacks as the air arm is unable to forestall by bombing or meet by fighter action.

Naval supremacy in the Mediterranean will likely remain British provided the Navy is persuaded that the proper cargo of aircraft carriers in that sea is fighters. The issue is not one of bomber or battleship but rather that of how much air defence a fleet must be given. The issue may be redefined before long and revolve around a new naval proposition: "Battleship or Aircraft Carrier."

A Day of Action

[Extracts from a translation of an article by Captain Schneider Kostalski, in *Die Panzertruppe*, December 1940.]

Condensed by LIEUTENANT J. J. GLEASON, *Infantry*

This was to be the big day when we were to prove our mettle. We wondered if our opponent would be a better fighter than the Poles. We learned that the Paris Tank Division was lined up opposite us, thus confirming our suspicions that we should encounter hostile tanks on our first day of action on the western front. During map exercises and sand-table talks we always emphasized the possibility of encountering enemy tanks. By means of illustrated lectures every single man had fully acquainted himself with the appearance and vulnerability of the enemy tanks.

After considerable heavy fighting against French defensive positions and antitank installations, we paused to get our bearings. While I was orienting myself on my map, my men suddenly shouted: "Enemy tanks!" In fact we could recognize about 50 enemy tanks maneuvering on our right flank as well as on our front. Two Mark III tanks of the 4th Company began to fire at the hostile tanks from a distance of about 600 meters (660 yards). A glance at the map showed that my company should be a little farther to the left. I could neither see nor hear anything of the other companies of the regiment. Hence I decided to continue the attack alone, keeping well to the left.

Being the leading tank, I moved toward a village. Suddenly, a French H 35 tank appeared on my right front. The muzzle of its 37-mm gun moved as if to take aim at my tank. I immediately sent him a magazine full of 20-mm projectiles from a range of about 90 yards. Then the 37-mm gun barrel stopped moving and clouds of smoke emerged from the tank. I do not know whether my shots actually penetrated its armor or not, but this tank did not fire at any of my tanks after that. We noticed a large number of fine-looking tanks and motorcycles parked in an orchard near the edge of the village. Frenchmen with the visorless steel helmets of the motorized troops appeared everywhere. We fired our machine guns into the parking area as we drove past it and upon the French troops who were fleeing in all directions. In the center of the village we found that the road was again completely impassable due to a deep crater.

A sunken road turned off to the right. This road was the only means of escape possible out of this cursed dilemma. I expected to encounter a hostile tank directly ahead of me at any minute. The French still gave me the impression that they were taken completely by surprise and expected to be attacked from all sides simultaneously. That was our only salvation.

French troops were sitting on the 10-foot banks on both sides of the sunken road. Our turret doors were open, as usual. I could not close them because at each turn of the road I expected to run into enemy units and dared not take my eyes from the optics or my hands from the elevating mechanism. This precaution soon paid. When taking a curve I saw a French H 35 tank approaching me from the opposite direction. The width of the road just permitted me to pass it providing it kept sharply to the right. I succeeded in forcing this tank to stop and I immediately fired half a magazine of 20-mm projectiles into it before its gunner was able to do anything at all. The striking force of my projectiles was so great that the driver's door of the hostile tank sprang open. I immediately fired a burst of machine gun bullets into the doorway. Then we hurried past the motionless, burning enemy tank.

Fifty yards farther on, the same action was repeated with another hostile tank. I succeeded again in blowing open the door and putting the crew out of action. Then I met a third enemy tank standing in the road. Perhaps he had noticed the fate of his comrades and decided to take us on at a halt. In a flash I opened fire, but unfortunately this time the door did not burst open. I cannot say whether he had fired at me, but the situation soon became very awkward. I knew that if he continued to fire with his 37-mm gun, or if he merely opened fire, he probably would destroy all of us, because his weapons and armor were superior to ours. Suddenly, two hands were raised high up in the air from the gunner's rear turret door. This took a weight off my mind. Driving up, I called to the two Frenchmen to dismount. Then I dropped a hand grenade into the tank and put it out of action.

At last, the sunken road broadened out into open fields. I heard heavy firing from German and French machine guns and cannon far behind me. My radio transmitter suddenly gave out so that I had to direct my company by visual signals and personal example. We did not dare to stop here in the midst of the enemy, so we continued in the direction of the attack. Suddenly, on my left, a French heavy tank of the Somua type came into view. Prior successes probably made its commander rather impertinent. The front and sides of of this armored monster are invulnerable. So I decided to attack it from the rear. Utilizing some rising ground and my superior speed, I succeeded in sneaking up to him from the rear. I followed in his trail at a distance of 25 yards. My driver halted so that I could take a good aim, and I fired 10 rounds into his back. A huge smoke cloud emerged from the tank but it moved calmly ahead. Before the commander of this tank could turn his turret with its 47-mm gun in our direction my driver had already rushed to cover behind rising ground. Disappointed in this action, we drove back to my other tanks.

Suddenly, I felt a heavy jolt. Smoke and a burning smell filled up the interior of the tank. My driver shouted: "Motor stopped! Direct Hit!" We abandoned our faithful vehicle in a hurry. All three of us were uninjured, except for some bullet splash I had received on my hand when the first tank crashed against the edge of my turret. The radio operator and myself immediately set up a captured French machine gun and combed the edge of the village where we suspected the hostile antitank gun to be concealed.

Motorized Reconnaissance Detachment in Combat in Flanders

["Motorizovanniy razvyedyvatelniy otryad v srazhenii vo Flandrii," by Wim Brandt in the *Militär-Wochenblatt*. Translated from the Russian by Lieutenant Joseph Dasher, ORC, from *Krasnaya Zvyezda*, 20 November 1940.]

On 18 May, the motorized detachment, having received orders transferring it to the south, departed from Rosendaal and following the route through Tilburg, Eindhoven, Hasselt, arrived in St. Lambert at dawn on 19 May, having covered about 90 miles in 24 hours. After resting there one day, the detachment moved at night, through Huy, to Houyet, where a halt was made. After waiting before Givet the latter half of 20 May, due to the fact that the bridge was being used by an infantry division for crossing, the motorized detachment at the fall of darkness continued its advance to Hirson. This night march was especially memorable. There was endless congestion on the road, and the French aviation, employing rockets, bombed the moving columns several times. Hirson was reached in the morning of 21 May. Thence the detachment moved further on through Guise and Bohain to Bantouzelle south of Cambrai. Here, too, endless columns of infantry and throngs of refugees moved on the one road, and it was well for us (Germans) that we had the complete command of the air. On this same day a German moto-mechanized group reached the English Channel.

However, it was not possible to rest at Bantouzelle because the detachment was ordered to proceed to Van Quentin. South of Croisilles the movement stopped. At the headquarters of the nearest infantry division it was learned that the enemy had undertaken a number of counterattacks in southern and southwestern directions. The detachment then was given the opportunity to proceed forward as far as Boisrit where it was delayed. Here one motorized division was engaged in combat. The enemy tank attack had created a critical situation. All kinds of wild rumors were circulating, such as that the entire terrain west of Arras was in British hands, and that the Avesnes le Comte is being especially strongly held by the British. All this, however, was greatly exaggerated and on 22 May the detachment proceeded on to Avesnes le Comte, sending only the 3d Company on Simencourt. Both points were reached without enemy resistance, and immediately antitank security measures were undertaken. Reconnaissance parties, sent north and south of Avesnes le Comte, failed to find the enemy, although gradually some 200 enemy prisoners were captured. The situation of the 3d Company near Simencourt was less tranquil. As a result of enemy tank attacks our situation at Arras appeared to be far from brilliant. In addition to this the detachment had not been refueled for 48 hours, and was able to move not more than another 30 miles.

About noon of 22 May, order was received in which mention was made of a deep flanking maneuver of two tank divisions along the seacoast. In this connection a division of Schutz-Staffeln (Elite Guards) was given the mission to protect their right flank, and moved its advance regiment in the direction of Aire. The reconnaissance detachment conducts reconnaissance in the direction of Aix Noulettes, Béthune and Lillers.

Three reconnaissance groups are dispatched. Reconnaissance Group I locates the enemy near Sérvin. Reconnaissance Group II reaches Béthune, but here it runs against obstacles reinforced by antitank guns. At last reconnaissance Group III reports that Lillers has been cleared of the enemy. All these reports were received before nightfall. At the same time the neighboring units to the right begin to advance in the northerly direction, west of Arras. Using its last supply of gasoline, the reconnaissance detachment arrives at Antennes and establishes itself in a chateau nearby, where a supply of motor fuel, left by the British, is found.

On the morning of 23 May, the reconnaissance group, which during the night had maintained contact with the enemy, rejoined their unit. Thereupon three new reconnaissance parties were sent forth by the detachment in the directions of St. Venant, Hazebrouck and Cassel, but not one of these parties succeeded in crossing the La Bassée Canal, because all the bridges were found to have been destroyed. The third party, advancing from the south through Mazingem, locates a French battalion astride the highway. An antitank gun is placed in position and opens fire on carts which are moving at the tail end of the battalion, while the commander of the reconnaissance party, after going around under the protection of a hedge fence, opens fire, from the shortest distance, on the head of the column. Under fire of two armored scout cars and two machine guns firing directly from motorcycle side cars, the French resistance was broken and the enemy surrendered. Towards the evening the detachment established itself at Floringhem.

On 24 May, regiments of the Elite Guards division succeeded in crossing the La Bassée Canal. The regiment on the right flank captures St. Venant while the reconnaissance detachment advances towards Allouagne. New reconnaissance is sent forward. Two reconnaissance parties had to advance in the direction of Estaries: one through Béthune, the other through St. Venant. While attempting to cross the bridge to the north of Béthune, the first party is subjected to enemy fire. One armored vehicle falls into a ditch, and motorcyclists are forced to dismount and engage the enemy.

The second reconnaissance party, after passing St. Venant at 2:00 PM in the direction of Merville, was already nearing the latter, when suddenly enemy tanks had cut off its retreat. Only one of the two armored vehicles succeeded in breaking through to the rear. At 5:30 PM this reconnaissance party reports that it is encircled by the enemy. The 2d Company, reinforced by antitank guns, is sent to its rescue.

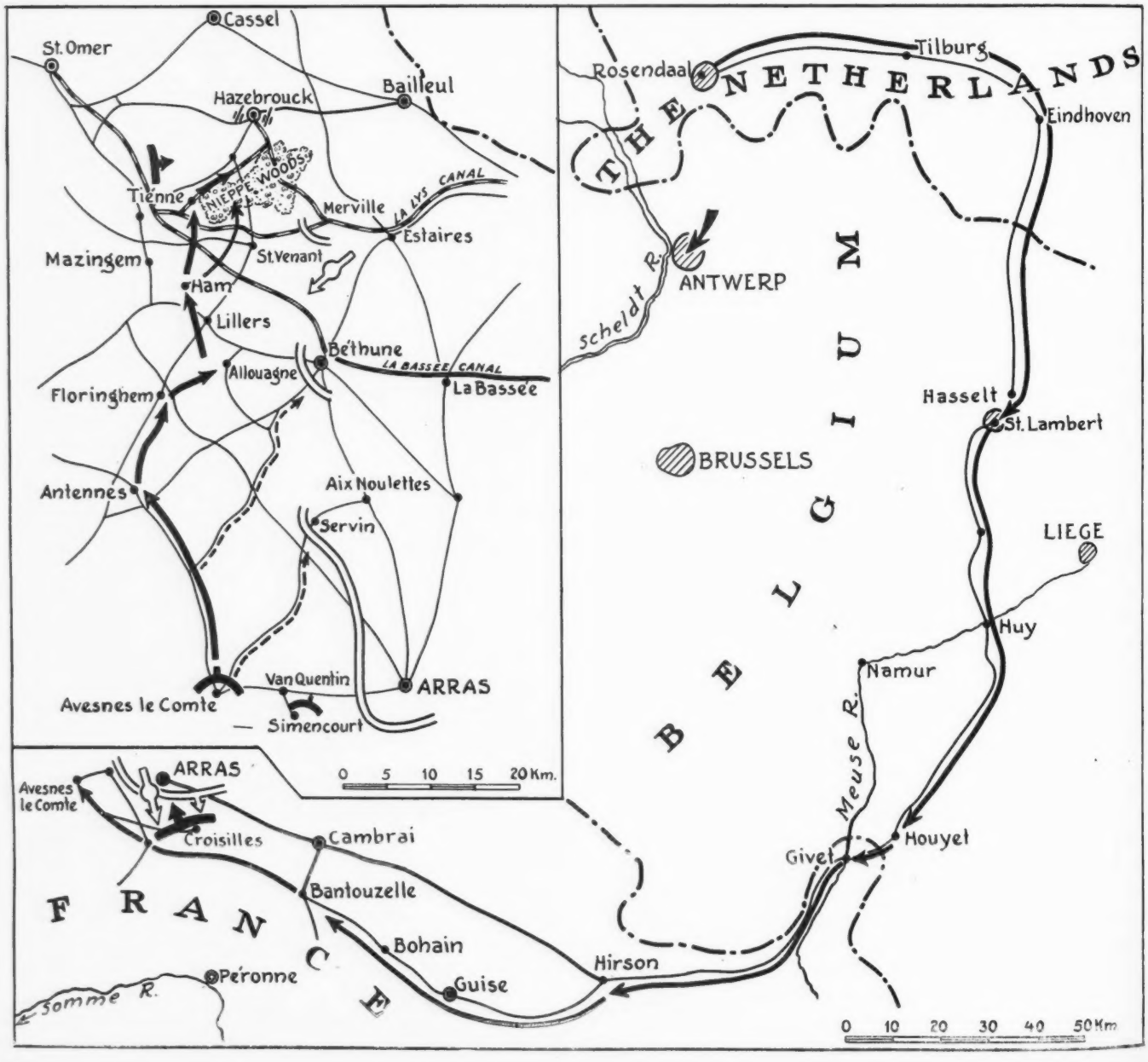
At the same time the British, moving through Merville in the southwestern direction, execute a tank attack against the German infantry. After a somewhat critical situation, the British attack was repulsed. Also the 2d Company, moving north of the Lys Canal, runs against British

tanks. Due to the fact that the elements of the divisions retired at nightfall back across the canal, the 2d Company was also compelled to retreat. The encircled reconnaissance party reported by radio that during the night it will attempt to break through.

The next morning the reconnaissance detachment was moved to Ham. A report was received from the encircled party to the effect that it was unable to break through, but up to 9:30 AM it nevertheless continued to communicate by radio on all enemy movements in the vicinity of Merville. Then the contact ceased. This party was captured by the British.

After an interruption of two days, on 27 May, the general offensive begins, having as its purpose the total destruction of the Allied army, encircled in Flanders. While the left flank regiment of the division captures Morbecque after heavy battle, the reconnaissance detachment, at about 8:00 AM reaches the Tiénne settlement, meeting only weak resistance. Measures are taken to defend this settlement against tank attack from the east. However, to the southwest of Niéppe woods, numerous British machine guns stop the advance of the neighboring battalions. The flanking fire of the reconnaissance detachments aids in the capture of these machine-gun nests, after which it details one company to each of the banks of the canal which runs along the edge of the woods in the southeasterly direction. There too, on the highway which runs alongside of the canal, armored vehicles were directed.

While the 3d Company, which was directed through the woods, was advancing without encountering the enemy, the 1st and 2d Companies fell under the heaviest artillery fire. The reconnaissance armored vehicles were withdrawn forthwith, but the 2d Company, which was moving along the edge of the woods, continued to advance. Finally the 3d Company also runs against the British, who were in position on the main road, running through the woods. With the support of flanking fire of the neighboring 2d Company, the 3d Company attacks and overpowers the enemy. The further



advance of the 2d Company and of the infantry was, however, halted by strong artillery fire from the direction of Hazebrouck. The next day Hazebrouck was captured, but battle was continued at Bailleul, where attacking German aircraft were continuously observed. In a short time enemy resistance was broken, and on the night of 1 June the division was sent for reserves into the vicinity of Cambrai.

A Few Words to Young Officers

["Algunas palabras a los jóvenes Oficiales," by General Abel Miranda. Translated from the Spanish by Mr. LaVergne Dale, Library, Command and General Staff School, from *Revista Militar*, February 1941.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

Your words will always be heard with respect by your subalterns if you support them with action and example; if you do not, these very words will bring your own faults into relief.

Do your duty for duty's sake, and not for the benefit it may bring to you, for that would be a debasement of your work. If you are given charges (or positions) that signify distinction or honor, let it be the results of the recognition of your merit, but never the result of a plan pursued with selfish efforts.

Guard jealously your prestige as a soldier; try to increase it constantly, for it is indispensable in the exercising of command.

The ambition to advance to the highest rung of the military hierarchy is just and noble; the most important thing is not this, but your own worth and value at whatever rank you attain. Neither titles nor diplomas are proofs of professional capacity.

Study to increase your professional knowledge, but remember one commands more respect because of prestige rather than knowledge.

Take care to merit the high opinion of your subaltern, not through a cheap spirit of vanity, but because he is the one to whom you have to give orders, and if you are to succeed in this, he must have full confidence in your ability.

A soldier needs a lifetime to acquire prestige, but a second is sufficient in which to lose it.

Remember under all circumstances that you are wearing a uniform and not a suit of livery.

Never confuse subordination, which is the self-denying virtue of a soldier, with submission, the low state of the serf.

Be an airplane and gain altitude by your own forces and not a glider which rises only because it is towed.

Be even a Quixote in your acts; never a Sancho.

Do not stifle, in your subordinates, feelings of pride; on the contrary, encourage and direct them; if you do not, you will have lambs and not lions on the field of battle.

When you have a subordinate who seems to be ambitious, do not hinder him; study him and try to guide him; it is a force like that of a torrent, which builds or destroys; it all depends on how it is guided.

Without question the factor of chance has its effect in the outcome of an undertaking, but this factor intervenes the least, the greater the talent and foresight of the one charged with it.

Do not destroy the work that you find done, unless you replace it with something unquestionably superior.

Thinking over, solving and executing, must be the unbroken succession of phases of every military problem presented to you.

Fellowship in an army is the index of the moral solidarity of its officer group. This feeling is not based merely on the external manifestations of social character, but on something much more solid: mutual respect, esteem and consideration.

Confidence in oneself must be a characteristic of an officer, and must never be confused with a petulant self-worship.

The Argentinean officer has the fortune to possess in his own history the archtype of soldier, General San Martin. Even though to God alone is it given to concede the gift of equaling him in his military genius, it is within the range of our possibilities to resemble him, in the matter of his soldierly virtues.

Function of Parachutists

[From an article in *The Aeroplane*, (Great Britain), 21 February 1941.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

Parachute troops, as a new factor in warfare, may completely alter the accepted conceptions of offence and defence. The Germans showed how effective they could be in spreading disorder, particularly when aided by traitors. In the campaign through Holland and into France, the enemy used parachutists as shock troops to be followed up by air-borne infantry and by mechanized forces.

The British parachute troops which were landed in Southern Italy on the night of 10 February had a different purpose. Their aim was to disorganize communications and essential services so that the already tottering Fascist order would be hurried a step nearer its ultimate collapse. Their object was not to prepare the way for the immediate arrival of invading forces and apparently some method was arranged for the evacuation of such troops as could escape when their assigned task was done. No doubt Bristol Bombay bomber transports would be used to deliver these parachutists. The newly captured airdrome at Benghazi is only some 400 miles from the toe of Italy and well within the non-stop return range of the Bombays.

The bravery of the men told off to undertake such a task is splendid. The multitudes of hostages, including many generals, now in our hands, doubtless reassured those who planned the exploit that the parachutists who were captured would not fare too hardly. The complete collapse of Italy which may occur in the not far distant future should ensure but a temporary exile.

Whether used as shock troops in the advance of a great army or as nuisance raiders, more or less unsupported, parachute troops must be faced as a new factor in warfare. As

the Italian incident proves, they can be dropped at night even more easily than by day. There is no doubt that the big four-motor aeroplanes now possessed by both sides could transport two or three thousand parachute troops and deliver them on or near an enemy aerodrome at night in a very short time. Their object would be to put out of action all the aeroplanes they found there and to wreck the station before surrendering. Such method, though costly, might be more likely to succeed than the most intense daylight bombing attacks like those in which the Luftwaffe attempted to smash our fighter stations last autumn.

Aerodrome defence is one of the essential items in air supremacy. Our fighters and our bombers are essential to our continued existence. They must be guarded day and night with every device and safeguard at our command.

Just as the bomber has brought the whole of each combatant nation into the front line, ignoring geographical barriers which held up armies in the past, so the development of the parachute arm of the armies of the future will render useless any prepared line of defence of opposing armies. As aeroplanes develop and bigger loads can be carried so will the menace of the parachute troops grow. Already the huge Douglas B-19 in the U.S.A. could accommodate more than 100 fully-armed soldiers. Speed and ranges are increasing so that the future may present the prospect of 10,000 soldiers landed by night in the heart of enemy territory.

These developments will probably include gliders still further to increase the loads. With them light tanks could be transported. Already this war has become an air war.

Tactical Employment of Tanks Under Winter Conditions

[From an article by Colonel P. Rotmistrov, in *Krasnaya Zvyezda*, 17 December 1940. Translated from the Russian in the Translation Section, the Army War College, Washington, D.C.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

Tank action is not always impeded by winter conditions. Snow a half meter deep affords no difficulty for the tank. Snowdrifts covering low ground, ravines and gullies are avoided. Ridges and high ground, where snow lies less deep, are usually sought out as courses of action, despite general rules.

Tanks may be employed where the snow is a meter or more in depth, as was the case in Finland. In such event, however, it is first necessary to determine the depth of the snow, the size of the ditches, gullies, deep pits or craters, antitank trenches, that may be covered with snow.

Where the snow is of considerable depth the tanks must be given strict orders not to move one behind the other in the tracks of leading tanks. A second machine following in line will usually settle down and get stalled.

Zero weather, freezing rivers, lakes and marshes, render the terrain approachable everywhere and thus somewhat facilitates the action of troops. However, only marshes covered with thin covers of snow or those without any snow, will freeze over. Where the snow is over half a meter thick, the marshes will not be affected by the frost and remain soft. In Finland, for example, the tanks in some cases fell through while moving over such "frozen" swamps. To prevent such occurrences, all marshy sectors were marked with black pencil on maps and sketches issued to officers to indicate dangerous areas.

Light tanks may proceed over ice without special preparation of routes where the ice is over one-half meter thick (about 20 inches). At the same time, however, the movement over a single track by over five or ten machines must be avoided. Small groups of tanks proceeding over solid ice, should encounter no difficulties.

The march of tank troops in winter is accomplished in the usual manner. Over slippery roads with slopes of about 10 degrees the tanks should use grousers on their caterpillars, or else should have part of the tread reversed.

The position of tanks in march formations of larger units is determined by the particular strategical situation, and will depend on the availability of roads, on the nature of the terrain, the thickness and nature of the snow.

On the march, tank units, as a rule, proceed in separate column along with infantry ski detachments. Each tank may carry three to five ski troopers, depending on the particular type of tank. Thus, a tank battalion may take with it a company of ski troopers, capable of providing it, in close terrain and in difficult sectors, with the means of reconnaissance and security. In the event of an encounter with the enemy, the ski troopers at once engage in action, cooperating with the tanks.

In a march anticipating a meeting engagement, the reconnaissance parties sent out by tank organizations (or general units), note on the map or sketch the condition of roads and adjacent terrain, in addition to the ordinary data. The information describing the terrain, the depth and condition of the snow (whether solid, soft, even, or in drifts), is noted by conventional signs.

In meeting engagements, where conditions permit the employment of tanks over cultivated fields, the tanks may operate in mass formation both in the delivery of independent attacks or in the immediate support of the infantry. In the case of meeting engagements, in winter it is particularly advantageous to attack the hostile artillery which, because of the deep snow, is usually incapable of leaving the roads and taking up positions quickly.

Where the close terrain or the considerable depth of the snow is such as greatly to reduce the maneuverability of the tanks, the latter are utilized in the immediate support of the infantry by separate detachments. In the circumstances, the tanks are distributed in advance among the columns and subordinated to the appropriate infantry commanders, while

the action of the tanks is developed primarily along the ridges of high ground and along roads.

In offensive action, light tanks in winter usually participate in the general attack with the infantry in areas approachable by the tanks. Where snow is deep, wider caterpillar treads must always be employed.

The tank attack is delivered in depth. The attacking tanks are followed by small detachments of ski and infantry troops. The restriction of the attacking tanks to separate areas necessitates the powerful support of their attack by strong artillery fire, including antitank artillery, along with that of the heavy infantry weapons. At the same time, duly considering the limited areas that may be subjected to tank actions, the enemy will be able to concentrate powerful antitank weapons at such areas. To negotiate trenches and steep slopes, the tanks may carry behind them a variety of auxiliary equipment.

During the war in Finland we made wide use of armored sleds, drawn by tanks, each carrying about seven infantrymen. Upon reaching the main line of resistance, the armored sleds were uncoupled. The infantry then advanced to the attack on the hostile trenches, supported by the fire of their tanks. This method of transporting the infantry permitted it to reach the main line of resistance without losses and without lagging behind the tanks.

During our Finnish operations we were quite frequently called upon to engage the enemy in woods. While the tanks would move through woods, snow falling from the trees would cover all their eye-slits, means of observation, and periscopes. Crews were unable to maintain observation. They had to get out of the tanks and wipe the snow from their instruments. Within five or ten minutes the process would be repeated. Here the artillery helped. Before the launching of a tank attack the artillery would fire several rounds in the sector of the woods involved. This would clear the snow from the trees, and the tanks could then advance to the attack without interference.

In instances where the enemy begins to withdraw, the tanks attack the retreating hostile forces with utmost speed, since the enemy will be moving over the snow slowly—especially his artillery.

Here the tanks in cooperation with the aircraft and ski troops may inflict serious losses upon the enemy.

In certain situations hostile tanks may attack from several points while the manner of reaching these by friendly tanks from a single area will be difficult or even impossible. In such event, the tanks attached to infantry divisions take up positions in decentralized formation, ordinarily by company, and are placed under the control of infantry regiments. A part of the tanks, however, must nearly always be in divisional reserve.

The basic mission of the tanks in defense is to engage the tanks of the attacker. Only where the attacking enemy does not possess any tanks may friendly tanks be employed against hostile attacking infantry. In such event, the tanks operate in winter in the usual manner, in conjunction with the counterattacking infantry. If the nature of the terrain is such as to preclude this, they may be employed in separate areas.

In event of attack by hostile mechanized forces, the tanks of the defender, taking advantage of the slow speed of the machines of the attacker, incident to the deep snow, open their fire upon them from halted positions or ambuscades in conjunction with the friendly antitank artillery. After the enemy has been defeated, the tanks of the defender counterattack.

Obviously, due regard must be had for the particular situation. The following incident may be of interest in this connection. During the fighting at Vyborg, in one of the sectors our advancing tanks were suddenly confronted by the long-range fire of Finnish tanks. In reply, there was at once opened the intensive fire of our tanks and artillery that accompanied our tank attack. Apparently beginning to suffer casualties, the Finns launched a frontal counterattack. A tank battle developed.

The Soviet light tanks boldly met the oncoming Vickers tanks and in several minutes of fighting a part of the hostile tanks was put out of action. Some received direct hits during attempts to turn about and to withdraw. The enemy became confused, since our tanks were getting close now. As a consequence, the Finnish forces were routed. Some hostile tank crews abandoned undamaged tanks and fled on foot.

Deep snow in defense situations affords the defender many opportunities for launching counterattacks. Most advantageous for a counterattack by tanks is that moment when the enemy has become disorganized and weakened by his losses, when he has become exhausted by efforts to overcome snow barriers, and the hostile accompanying artillery has fallen behind. Here the tank detachments of the defender, proceeding boldly and decisively, may first rout the tanks of the attacker and then counterattack the hostile infantry which, in winter, will usually lag considerably behind the tanks.

Highly important in the employment of tanks in winter is that they be maintained in constant readiness for action. Suitable provision must be made so as to permit the tank personnel to gain proper rest. During the Finnish War, in order to conserve the equipment and to insure economy in the use of fuel, in the employment of tanks at particular points for five days or more, tanks were usually dug into the ground up to the approximate base of the turrets. Between the caterpillars, a trench was dug of 1 to 1½ meters in depth. Here, beneath the motor, a small brick or iron stove was placed to warm to tank. In order to preserve the heat and conceal it, a tarpaulin was stretched over the tank and covered with a thin layer of snow.

This arrangement made it unnecessary even in the severest cold to warm up the tank by the motor more than two or three times in 24 hours. Motors started quickly and were always in complete readiness. Along with this, the tank crews were afforded proper protection by taking cover in the dugouts.

During brief halts in winter, tank motors, as a rule, are kept running, while the tank personnel rests under the tarpaulin near the engine of the tank. The exhaust must not be covered by the tarpaulin, or the men may be asphyxiated.

While the employment of tanks in winter does involve certain special features, the tank may be employed in all types of action. The principles governing the general employment of tank forces apply fully to winter conditions as much as to those of any other season.

The Staff of the German Army

["El Estado Mayor Alemán," by Lieutenant Colonel José Fernández Ferrer. Translated from the Spanish by Mr. LaVergne Dale, Command and General Staff School Library, from *Ejército—Revista illustrada de las armas y Servicios*, October 1940.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

More useful than argument and speculation concerning the existence and nature, or supposed or real secret artifices of war, is the study of military groups and organizations of notable efficiency, taking part in the struggles of war. Among these, preeminently outstanding and worthy of attention, in the case of Germany, is the Great General Staff. This organization, an actual intellectual syndicate, as one Frenchman called it, is justly feared by its enemies.

The German General Staff is, in reality, a unique organization, fervently revered in its fatherland, and looked upon with hatred (fear) and vigilant uneasiness, by the traditional enemies of Germany.

"The Great German General Staff,"—said article 160 of the Ex-Treaty of Versailles—"and all similar organizations, shall be dissolved and may not be reconstituted in any form." This death sentence, dictated by unreasoning hatred, is, without question, the greatest homage that can be rendered to the eminence of the victim, which in the judgment of a Frenchman, also was the deciding factor in the defeat of France in the Franco-Prussian War.

The Prussian Staff, which later served as basis for the German General Staff, was organized after the defeat at Jena, in which the Prussian methods of command were proved antiquated.

The fundamental principles and methods of the Prussian Staff were dictated by General Scharnhorst.

In Napoleon's coach, a short time after the battle La Belle-Alliance (Waterloo Campaign) was a memorandum with the following notation by the Emperor: "Scharnhorst, former professor of mathematics, German pedant."

This pedant and German mathematician, was the one who, in a state resting in lethargy on the laurels of the Great Frederick, built up a truly national army during five years of strict penury under the suspicious and continual vigilance of Napoleon. For this reason Scharnhorst is regarded in Germany as the great hero of the War of Independence, and the organizer of the military power of his country.

Later Gneisenau introduced certain modifications in the organization and functioning of the Staff, particularly in matters pertaining to the High Command, which still exist in the present service. The division of functions between the two generals, Blücher and Gneisenau, solved the problem of distributing military power in the characteristic form of the German Army, which places the joint responsibility and the division (of duties) of command, with the general and his chief of staff. Working under this formula, the duumvirates of King William I and von Moltke, Hindenburg and Ludendorff, and Mackensen and Seeckt, obtained great victories in modern times. The genial perspicacity of Napoleon had already discovered, on observing the military course pursued in Prussia since 1806, that two serious rivals had appeared: Scharnhorst and Gneisenau, whom he would have to face. These two had the task of outwitting the vigilance of the Emperor and of suffering in their own country the opposition which presumption and lack of comprehension awakened against them. Scharnhorst was regarded by many of his fellow-countrymen as a dreamer and theorist, of too fine and gentle a temperament for a soldier. When he was a director of an artillery school, the Prussian officers ridiculed him for his poor work in directing the parade of the guard. He was not a simple dreamer, however. His ardent desire was for action and the supreme command. "If I could be commander in chief," he said; and again, "I would give all my decorations for one day as commander in chief." This intimate and sorrowful confession, made to his daughter a little before he died, reveals the sad tragedy of his life; for he, who had forged the arms of Prussia, had had to content himself with the playing of a secondary role. "I. limited myself," he said, "in order to obtain the promotion of qualified persons; but I was able to bring this about only by sacrificing my own ambitions."

He was not a general only—the most ambitious and tragic soldier of German history, as a certain writer says, he who had to bridle his impulses to command and his desires for action and suffer the deprecatory observations of his companions.

The same thing was true of Clausewitz, who, all through his life, burning with the desire for action, invigorating action which frees from the burden of meditation, was forced to hear from the lips of General von Brandt the accusation that he lacked experience and practice. And Moltke, himself, did not General von Reyher, later, accuse him of a similar thing?

It is probable, that on hearing this, there comes up in the minds of those accused of being theorists, of lacking practice, the recollection of the crude irony with which Marshal Sajonia alluded to the famous veteran mules of his army: full of practice but lacking in theory.

After the liberation of Prussia from the yoke of Napoleon, General Grolman it was, who perfected, in time of peace, the organization of the staff, assigning to it its historic mission as the institution of highest learning of the army.

Since that time the German Staff has dedicated itself to the study of the history and of the art of war, serving besides as school of command for commanders.

Many officers of the German Staff have passed down to posterity through their military works of imperishable value, and by the influence which they have exercised on the German art of war; but all of them are eclipsed by three stars of the first magnitude: Clausewitz, Moltke, and Schlieffen. Three famous names which still glorify the prestige of the German Staff.

Moltke, who gave to this organization universal recognition, was the greatest of all those who are outstanding in the Staff School, and became, not only the incomparable type of Chief of General Staff, but also, one of the most eminent generals of all time.

Since the time of Moltke, all enemies of Germany have been convinced that the staff of its army possessed the secret of military victory, and for this reason it is explained why, at Versailles, its disappearance was inexorably decreed.

The Allies did not succeed, however, in their intentions. The spirit of its creators remained latent and alive, and as

soon as Germany began to prepare itself to reconquer its liberty, the staff sprang to life again, with modern methods, but faithful to its glorious tradition.

The German Staff has always been an intense and silent focus of energy, a true secret branch which, although the determining and guiding force behind German victories, has endeavored to maintain its activity in an anonymity most rigorous and free from personal vanities.

This is one of the causes of the mistake that the opponents of Germany have repeatedly been the victims of making, as regards its effective military power. This was the case with France of Napoleon III, in spite of the warnings of its military attaché in Berlin, Colonel Stoffel, as well as the case with the Allies. The latter believed, in spite of their "Intelligence Service," that the German Army was nothing more than a loose and laughable parade troop.

The surprise has been tragic, and the mistake cannot be repaired with a new death sentence.

An interesting note, in closing. The historical work of the German Staff would have been difficult or impossible, without the prolonged permanence of its chiefs in their positions. This permitted them to develop their plans, accumulating information and forming a school. In the hundred years that went by between the Prussian War of Independence and the World War, there were only eight Chiefs of Staff. Schlieffen occupied the position 15 years; Krauseneck twenty, and Moltke thirty-two years.

Technical Considerations for the Engineers Regarding the Employment of the Army Construction Troops in an Advance

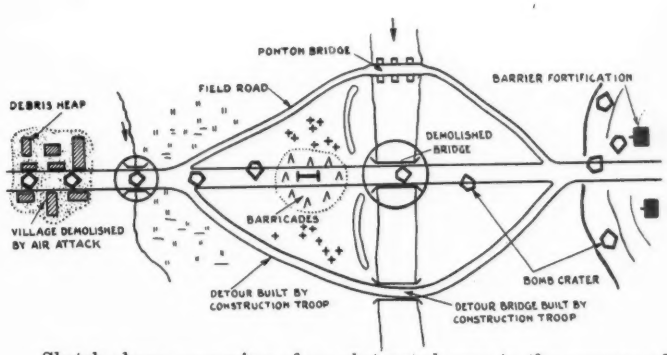
["Führungstechnische Gesichtspunkte für dén Einsatz der Heeresbautruppe beim Vormarsch," By Major General Klingbeil. Translated from the German by Mr. LaVergne Dale at the Command and General Staff School Library from *Militär-Wochenblatt*, 14 February 1941.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

Practically provided for in anticipation of mobilization, the construction troops have been fundamentally transformed in the course of the war both as to their ultimate use and as to their training.

In their present form, they are intended to relieve and to supplement the engineer force, which in large measure, becomes tied down in battle assignments along rivers and in attacks upon strongholds; and, due to the speed of modern army movement, is no longer in position, because of these extra demands upon it, to carry out those numerous missions of technical engineering nature, which are inseparably associated with the operations of modern, extensively motorized and mechanized armies.

The construction troops are, therefore, a technical auxiliary arm and are properly employed when used exclusively on technical assignments. They are properly employed where an operative or tactical decision is sought, and where it therefore becomes necessary as quickly as possible to overcome the natural obstacles or artificial impediments which hinder the advance of the attacking force. Accordingly, construction troops were used in the attack operations in France, mainly in cooperation with, or to relieve engineers. At that time they were employed in the clearing up of destroyed villages, and in the opening up of main roads, in the filling up or bridging over of bomb-craters, in the removal of obstacles of all kinds (as trees, timbers, rails, concrete obstructions, torn up roads, barricades, etc.) as well as in the construction of bridges and for passage over wrecked structures along streets required in the advance—in short, therefore, in the clearing up of destroyed districts. (See Sketch 1)



Sketch shows reopening of an obstructed zone to the passage of troops by engineers and construction troops.

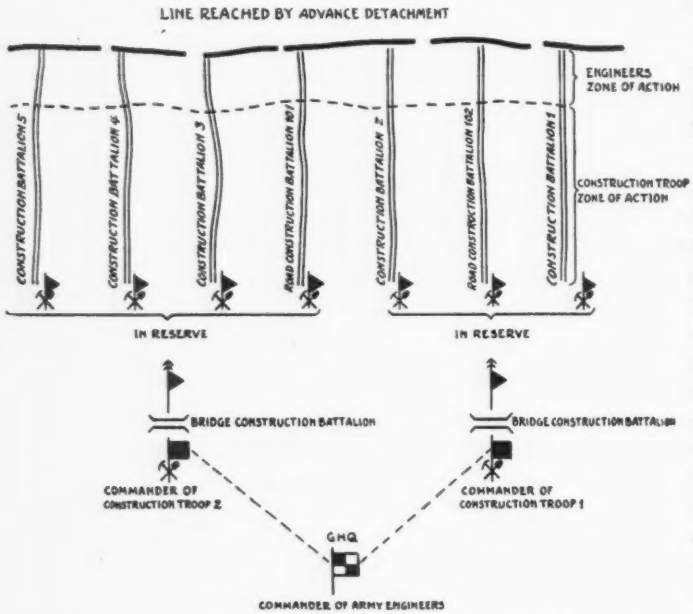
SKETCH 1.

It is not alone a matter of their technical work, but much more depends upon their opportune inclusion in the course of a battle of the combined arms; and of such timely carrying out of their missions that the forward movement of the attacking troops and of the reinforcements will experience no interruption, but continue steadily in motion. This requires an early reconnoitering of the roads for the route of march, a clear understanding of duties, a strict assignment of orders, and correctly-timed arrival of workers and materials to the scene of operations. The more mobile the construction troops are, the quicker the beginning and completion of their labors and the greater their efficacy for maintaining combat troops in position for action.

While there are generally known principles which have been tested by long years of war and peace for the employ-

ment of engineer troops, such rules had not existed to a sufficient extent for new construction troops at the time of their first employment in the attack operations in France. They could be formulated only during the course of the campaign. On this account, their employment with the army was variously managed. A plan for the employment of construction troops, which may be adhered to in all cases, can hardly be evolved, due to the variety of operative and tactical conditions as well as because of differences in the scene of operations and in the amount of obstruction offered by natural terrain boundaries and artificial obstacles. Tactical necessity may occasionally require the construction troops to perform engineer functions, and vice versa. However, on the basis of the war experience, lines of procedure may be laid down for the use of construction troops, which under normal and average conditions give promise of success. A few examples can be cited here.

In by far the great majority of armies, the disposition of the construction troops came under the command of the officer commanding the army engineers. (See Chart 1.)



Diagrammatic representation of the disposition of the construction troops along the advance routes of the army.

CHART 1.

This arrangement should be the most advantageous, since the work of the construction troops belongs, as we see from what has just been said, well toward the front in the combat area, and follows in a supplementary way as a relief to the engineers. The cooperation of the two branches of service is, however, best assured by their common control. In the case of other armies, the disposition of the construction troops was assigned to the chief quartermaster as a "behind-the-lines duty." For this purpose, he had available on his staff an officer for highway construction. In the case of an armored group, the rule was applied by placing a construction battalion on every route of advance. In order to be able to follow the rapidly moving armored troops, the construction troops were fully motorized before being placed with these troops.

Often, commanders of the construction troops (regimental commanders) are given certain advance areas of the army to watch over, within which they, in turn, place the construction battalions under them, on the individual roads. Now and then the apportionment of the roads to the various construction battalions was made directly by the engineer officer of the army or by the chief quartermaster.

On receiving the order from the army, the commanders of the construction battalions hasten, by means of a rapid reconnaissance as a basis for the placing of the troops, to obtain a mental picture of the number and kinds of obstacles, mine craters, destroyed bridges, requirements of manpower, time, equipment and construction materials, as well as the placing of men, their rapid transportation to positions, and the reserves of construction materials.

The detailed reconnaissance which follows the rapid reconnaissance, offers the construction battalion commander the necessary information for the carrying out of restoration tasks.

For this purpose, the construction battalion commander stations his companies on the route of advance to carry out the necessary measures for reconstruction. To speed the troops into action, light trucks of the construction column and any chance motor vehicles can be used advantageously for the transportation of men and apparatus. In case the routes of advance are being used at the same time by fighting troops, is is encumbent on the commander of the troops to insure the advance of the construction troops by traffic regulation in such a way that the repair of the roads is promptly accomplished. Construction troops work by leapfrogging, that is, men who finish their task at the rear take up a position at the front, in order constantly to be ready for new employment. Their movement can be expedited by relayed transportation within the construction columns. Toward the front, the contact must be maintained with engineers, in order that the latter may be relieved at the proper time. Construction troops are trained in all advance duties, including bridge building. For fast construction of especially large and heavy bridges, insofar as available, the bridge-building battalions especially trained and equipped for this purpose are assigned to the task. The continual furnishing of reports to the advancing troops and the higher command regarding the removal of traffic obstacles and the clearing of the routes of advance, form the basis for further decisions by the command: i.e., whether to continue the march, to bring up reinforcements, to prohibit heavy loads over certain roads, etc.

Palestine, 1918—France and Belgium 1940

A Comparison

[From an article by "W.A.T.E." in *The Journal of the Royal United Service Institution*, November 1940.]

Condensed by LIEUTENANT J. J. GLEASON, *Infantry*

The analogy between Allenby's operations in September, 1918, and the German breakthrough in May, 1940, is so remarkable that it deserves recognition even now before the detailed history of recent events is written in full. Mobility and ruthless pursuit were the keys to Allenby's success, and these were the two principles upon which the Germans staked everything in May, 1940.

Sir Archibald Wavell likens the action of the Twenty-first Corps in September, 1918, to that of a man pushing at the handle of a wide and heavy door, of which the hinges were in the foothills and the handle on the coast. Once the door was sufficiently ajar the cavalry pushed through, and in thirty-four hours covered 70 miles. Subsequently the cavalry in eight days reached Damascus, 150 miles in front of their advanced depots. This occurred when we had grown accustomed to measuring territorial gains by hundreds of yards rather than by miles. Why had this speed of advance become possible? Admittedly many factors contributed to the success of this operation, but the most important factor was the realization, by the commander who planned it, that once the crust of the defense is broken, the contents of the pie can be easily disposed of. Defense in depth is a military principle, but there is a limit to depth as there is to the thickness of a pie crust. The knife must be sharp and long enough to go right through the crust, and made of a material which will not rust if the blade is left in the pie until the tablespoon (which we can liken to the slower moving troops) is also pushed in to take the fruit out of the dish.

Now let us turn to 1940.

We all hoped that when the time came for active operations we should advance rapidly into Belgium and occupy a defensive position against which the German armies would hurl themselves in vain, the Maginot Line guarding the flank of the door we should have pushed ajar to get there. But Hitler realized the weakness of the hinge, and also understood that a door which has just been pushed half-open can quite easily be shut again, and by considerably less pressure than would have been required to have broken it in if it had never been opened at all.

So Hitler gently pushed on the swinging door, whilst he launched a mighty blow at the hinge. The hinge broke (no one had been to look at it for some time!), the door came off, and in swept the torrent.

Even then the torrent was expected to be of the nature and pace of a similar torrent in March, 1918; but to return to the former metaphor, the knife was much sharper and the crust much thinner. Like Allenby's horsemen, the German mechanized troops pushed on rentlessly to Amiens, as had the former to Damascus (and very much the same distance). For a considerable time the strength of the breakthrough was not appreciated, whilst precious days were wasted in attempting to arrange with the French the counterstroke to the South which, in fact, never came off. During this period of ruptured communications, rumors, refugees and all the uncertainties of war, one heard more than once the suggestion that the German advance round the right flank of the British, French and Belgian armies in the North was but a gallant raid. More than once one heard this German maneuver compared to one of Stuart's raids in the American Civil War in the 'sixties of the last century, never to Allenby's operations at the beginning of this century.

It is here contended that the disaster could have been averted if the lesson of Megiddo* had been applied to the situation at the time. Incidentally the lessons to be derived from the operations in Poland in September, 1939, did much to reinforce the probability that this thrust by the German mechanized forces was intended to be in sufficient strength to deal the knock-out blow.

An immediate acceptance of this probability would have postulated a quick retreat to the Channel ports. These ports would then have been defended by first line troops in strength instead of by gallant odds and ends on the lines of communication and by the equally gallant defenders of Boulogne and Calais, sent out hurriedly, but too late and in insufficient strength materially to alter the setting for the final curtain.

How easy it is to be wise after the event!

*—Megiddo, Allenby's decisive victory in Palestine, September 19, 1918, which ended with the capitulation of Turkey.

The Tank Company in Forest Combat

["Tankovaya rota v lesnom boyu," by Captain P. Slesarev. Translated from the Russian by Lieutenant Joseph Dasher, ORC, from *Krasnaya Zvyezda*, 12 November 1940.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

This Russian concept is directly opposed to ours in its employment of tanks. The author believes in splitting up his tank forces where we believe in "mass." He wishes to use tanks as machine-gun nests and our policy is to take full advantage of their mobility. His methods of contact and coordination are different from ours.—Editor.

Tank actions in wooded terrain strongly differ from those in open field. Frequently visibility from the tank will be limited, which complicates observation of the enemy and of his centers of resistance. Also, trees hamper the maneuverability of tanks, making them more vulnerable.

Under such conditions only small tank units—platoons, companies—will act jointly with infantry. As usual a tank company will be attached to the infantry battalion. As the situation may require, the battalion commander may use the tanks in the principal direction, without breaking the tank company into small parts, or may reinforce each of his companies by a platoon of tanks. Even in the latter case, the battalion commander will strive to reassemble the tank company in order to have a mobile, powerful reserve for overcoming the most stubborn center of resistance, for repulsing enemy counterattacks, and, occasionally, for pursuit.

Most frequently the commander of the tank company will receive orders for joint action with infantry, while still in position of waiting, and upon receipt of such orders will lead his company to the starting position. In most cases the company commander will have a few hours at his disposal before the attack, and he must spend this time in the study of the terrain, enemy positions, etc.

At the line of departure, the tank company will break up into platoons. All around observation of terrain and air is organized. One tank in every platoon is designated for security service. The commanders of these guard tanks should place them in such manner that the trees will not interfere with the complete turning of the turrets. All approaches to the tank company's position must come under fire of two tanks.

After inspecting the camouflage of the tanks, and the security of the position in readiness, the company commander, accompanied by platoon leaders, conducts a personal reconnaissance of the terrain and of the hostile main line of resistance. Special attention is given to the location of antitank guns and machine-gun nests, approaches to them, scarps, upended rails, obstructions, and other obstacles. At the same time the routes of advance are selected, and these are later marked by cuts on tree trunks, or by arranging branches on the ground pointing towards the enemy.

If there are hills in the forest, it will be necessary to determine the angle of climb and descent. The commander will mark on the map the angles of climb and descent of those hills which are deep within the defensive position. Careful attention will be given to boggy places on the terrain and to forest streams. The company commander determines what engineer work is to be done (leveling of banks, placing of planks, etc.), and he will report on this to the battalion commander, who then details the necessary number of engineers.

If there is sufficient time before the attack, the platoon commanders take tank commanders and drivers over the route of advance. Drivers memorize the characteristic features of the route, the nature of soil and the thickness of trees. The latter is especially important, as in approaching the main line of resistance some trees will have to be felled in order not to change direction. While going over the terrain, markings should be made with branches or pennants, wherever own infantry is situated.

Meanwhile, the tank company commander confers with the infantry battalion and the artillery commanders concerning matters involving cooperation. They jointly arrange signals to call for and to curtail artillery fire, as well as signals to be used between infantry and tanks. Infantry should have a special signal, calling for the return of and aid from the tanks.

When the signal to attack is given, the tank company begins to advance. It advances in platoon columns up to the man line of resistance.

Upon reaching the main line of resistance, the tanks must make a sufficient number of gaps in the barbed wire entanglements to enable the advancing infantry to pass through. Sometimes, in the field, one tank platoon is designated for marking the gaps. The tanks of this platoon move alongside of the entanglements, destroying them through sheer weight. At the same time the other tanks give this platoon fire protection and attack enemy centers of resistance. This type of action will not always be possible in a forest due to thickness of the trees. Therefore, the company commander should deploy the tanks in sufficient time to create at least a limited number of gaps, but enough to accommodate the entire advancing infantry.

During forest combat, tank crews must always remember that all roads, clearings and paths will be the first to be fired on by enemy artillery. If an enemy gun is observed near a road or clearing, one tank crosses the open area at maximum speed and, using the cover of bushes, attacks the gun from the flank. The other tanks of the platoon select cover and fire on this same target from a stationary position. In a forest, the "pincer" movement will often be impossible due to poor visibility and the danger of hitting friendly tanks.

The infantry must always aid the tanks in locating enemy guns, directing them to the target. It is important that all infantrymen give the tank crews timely notice of the targets observed by them. Infantrymen should also use

the simplest signals for pointing out the concealed routes of approach. During all this the infantry must always move behind the tanks, so as not to interfere with firing to the front and flanks.

In turn, tank crews must watch carefully for the movements and signals of their infantry. Whenever infantry continues to stall for a lengthy time, the nearest tanks—without waiting for a call for help—must return on their own initiative and determine the cause of the delay. The rate of tank advance in a forest is below that in open terrain, and the infantry is thus able to follow closely behind, using the tank's armor as cover against enemy fire.

Another characteristic of forest combat is that the enemy will make the widest use of antitank obstacles in all sectors. Even where the obstacle is already passed by own infantry, and de-mined, its demolition often consumes much time. Tank crews must not wait for passages to be opened through the obstacles, and thus fall behind the infantry. Their task is to force themselves over the obstacles, using their weight to press the felled trees into the ground. During this operation the driver must direct the tank across the tree trunk. When a tree trunk wedges in between the caterpillar tracks, it is easy to tear off a caterpillar in making a turn, thus temporarily disabling the vehicle.

Due to the large number of obstacles, boggy places, and oftentimes sharp hills, antitank guns and guns of the supporting force will sometimes fall behind the first echelons of the advancing battalion. In order to insure that the artillery keeps up with the infantry, the guns should be adapted for speedily attaching them to the tanks. The towing of guns by tanks over obstacles and boggy ground is entirely feasible in the forest, as demonstrated by recent tactical exercises.

Flag signals and tracer shells and bullets are the most dependable means for directing the tank platoons during this stage of combat.

When the main line of resistance of the hostile defense position has been penetrated, and the infantry liquidates the centers of resistance with its own means, the tanks may take a short rest. This rest period will be used by the tank crews for examining their machines, for making minor repairs, and for taking on fuel, etc. But even where the infantry is able to advance independently, the tanks must never be farther than 500 to 700 yards from the first echelon. Should the tanks fall farther behind, and should the enemy then counterattack unexpectedly, the tanks may be too late to help, because of limited speed and difficult orientation in the forest.

After crushing the main resistance of the defender the commander of the infantry battalion may give the tanks the mission of pursuit. The tank company may be able to outdistance the enemy, cutting off his route of retreat. This will require much initiative and decision on the part of the tank platoons and the company as a whole.

During this stage of combat, radio affords the best means for directing tanks, because flag signals will be ineffective whenever visibility between the tank platoon is lost.

The success of tanks in a forest will largely depend upon the continuous observation of the enemy and of own infantry. The driver of the tank always observes to the front; the tank commander, to the front and to the left; and the turret gunner, to the right.

As a rule, a point in the rear of friendly troops should be designated for assembling after an attack and pursuit. It is unsafe to assemble in enemy territory, even though the enemy may have been defeated. The forest gives good natural cover. The enemy may find the tanks and will fire and throw grenades on tank crews when the latter are busy examining their vehicles. For this same reason, long stops are not advised. Tanks which have lost their course should immediately follow the tracks of the command vehicle, which are easily discernible in a forest and especially on boggy ground. Thus own tanks may be rejoined.

Combat in a forest is a complicated matter. Tank crews are frequently forced to fight almost blindly, feeling their way. The vehicles may fall into traps, they may become stranded in mud. In all cases they must be aided by infantry, without delay. In all forest action, tanks and infantry must always proceed together, exchanging all information of the enemy.

Reconnaissance by "Schnelle Truppen" (Fast Troops)

["Aufklärung durch Schnelle Truppen," by Lieutenant Colonel Schönfeld. Translated from the German by Mr. LaVergne Dale, at the Command and General Staff School Library, Fort Leavenworth, Kansas, from *Wissen und Wehr*, January 1941.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

Sections of "Schnelle Truppen" (fast-moving troops) are organically placed in all units of the army—though different in their composition. They are entrusted with special assignments. The most important is reconnaissance. It is of *first* importance. The following description will provide an insight as to the character and the conception of reconnaissance.

Reconnaissance consists of obtaining such complete picture of the enemy, as may be required, for a successful, strength-conserving troop leadership; superior to that of the enemy. The production of these basic things is accomplished in various ways.

It is necessary to differentiate air reconnaissance, as made by reconnaissance planes, from ground reconnaissance by mobile troop units especially gathered together for the purpose. Both represent the eyes and ears of higher command in their purposeful cooperation and supplement, rather than duplicate, each other's effort.

Air reconnaissance is in a position to obtain a complete picture of the enemy situation extensively and on a large scale in a short time. Due to its own peculiarities, air reconnaissance can produce only fleeting, momentary pictures. It is well to remember the limitations which perforce confront air reconnaissance due to enemy action, weather conditions, cloudiness and ground fog.

As a rule, establishing evidence of current changes in the enemy's situation, as to space and time will be reserved for ground reconnaissance.

The data resulting from ground reconnaissance are then only of value when they precede the troop movements considerably and provide as comprehensively and unbroken a picture of the whole situation as possible.

The very first prerequisite for success is, therefore, the employment of "fast troops." They alone are able to hurry on ahead of the units of the army and to employ the time, thus gained, in reconnaissance itself; and in the quick impartation of the data obtained.

Thus we find division horse cavalry and bicycle units in our army as reconnaissance troops for the infantry. Thanks to horse flesh and the fast bicycle, they can exceed the rate of march of the infantry many times, cover broad stretches in considerably shorter time than these, advance ahead of the infantry, and report to the command so opportunely the picture of the enemy situation, gained in the reconnaissance, that the command can govern the march correspondingly, as to dividing and dispatching of its units.

Within armored and motorized divisions such troop units have assumed the duties of reconnaissance, and they also can march considerably faster than their divisions.

They are the armored reconnaissance detachments which, depending on their purpose, are composed of armored scouting vehicles, motorcycle snipers and other motorized arms.

In the main, the principles of reconnaissance are the same for the cavalry and cycle reconnaissance units as for the armored reconnaissance units. The method of execution is governed by differences in mobility capabilities and composition. In all cases, however, they result in the quickest possible gaining of a satisfactory picture of the enemy situation and of its equally quick transmission to higher command. The carrying on of successful reconnaissance is clearly defined with this assignment.

An untold number of requirements arise out of this relative to the organization, position and command of a reconnaissance unit itself.

The activity of a reconnaissance unit is the most inclusive and complex one could possibly imagine in military life.

It requires of command and troops, of officers and men, a measure of willingness to make decisions, of independent thinking and acting, broad knowledge and military ability in all fields as was never before required of a soldier. To a civilian this is incomprehensible. If, in imagination, we accompany a reconnaissance detachment on one of its varied assignments, we shall see that the multiplicity of the demands made on it cannot be exaggerated. Even in the giving of assignments to a reconnaissance detachment, the difference is clearly in evidence, as compared with other fighting troops.

An order for a troop to advance or attack can usually be condensed in clear and definite manner by the higher command. It is essentially limited to the announcement of the march with respect to the time of the attack; and of the march with respect to the point of the attack.

The giving of an assignment to a reconnaissance detachment embraces a multitude of points of prime importance to the command and in the employment of the detachment itself. These must contain all information regarding the beginning, the scope, the direction, the duration and the mission of their own troop movements on the one hand. On the other hand, they must contain a clear picture as to the aims of the higher command. The varied orders the reconnaissance officer may receive depend on the aims of the higher command. In the execution of these assignments, the reconnaissance officer will, and should, be bound by hard and fast rules as seldom as possible. For, in addition to the fixed principles to be observed in his assignment, the enemy's situation and intention now enter as a main factor. To adapt himself skillfully to the continually changing situation of the enemy, without hindering the plans of his own command, in fact, in decisive places and at certain times to impose his will upon the enemy, is the art demanded of a reconnaissance officer. Only the happy balance of these three components will give a reconnaissance detachment the possibility of reaching its proposed goal. I say possibility advisedly! For there still enter into the execution of the task a host of factors which operate decisively to influence results.

First, the cavalry, motorcycle or armored scouting party is sent on its way, by the reconnaissance officer, with detailed instructions regarding the mission. We get a clear idea of the duties of scout troops most easily if we compare it to the human body.

Just as the groping fingers of a searching hand, in the dark, the individual scouting troops of a reconnaissance detachment, feel for the enemy. They go on in different directions and distances. At times, they go on a dangerous path. With their orders, announcers and radio installations, they are comparable to the sinews and nerves of the human body; in uninterrupted and flexible touch with the reconnaissance officer. With resistless energy and unimaginable courage, their orders continually before their minds' eye, the aims of their reconnaissance officer constantly in mind, the scout detail officers work toward the enemy. From reports, constantly supplemented by his own perceptions, the reconnaissance officer visualizes a many-colored mosaic picture with contours in part clear cut, in part hazy. It is the first picture of the enemy.

But the far more difficult part of the reconnaissance begins at this point. Every scouting detail does not reach its goal. Because of opposition from the enemy, not every one is able to obtain a definite, clear picture of the enemy. Not every report from the scouting detail reaches the reconnaissance officer in time. In these cases, it will always be an art, inborn and difficult to acquire, to send out new scouting details, to the right place, at the right time and in sufficient strength in cooperation with whatever forces are available. The obtaining of the first reports concerning the enemy forms the basis for new activity by the reconnaissance de-

tachment. However, this first picture of the enemy gives only an idea regarding the limits of the area in or back of which major enemy forces may be suspected.

A number of essential questions must now be answered by the reconnaissance detachment, some of the most important of which are enumerated here.

How strong is the enemy? What does he have in the way of infantry, artillery, tanks and other arms? How is he organized? Has he taken up a position or is he only camping in the area? Has he ended his march or has he not yet started it? From where has he come? Where does he plan to go? In how many columns is he marching or does he plan to march?

From these and other equally important questions, ensues, perforce, the increased employment of all parts of the reconnaissance detachment to their bodily and mental limits, as well as to their limit with respect to numbers, space and time.

Time is the second factor affecting the results of reconnaissance. Like Damocles' sword, it hovers over the operations of the reconnaissance detachments. Every fleeting minute that passes by unused, every second diminishes the distance between their own and the enemy's main forces. With it, diminishes the time for freedom of action for the higher command. The reconnaissance officer must be greedy of seconds, without permitting over-haste to drive his reconnaissance detail headlong into destruction.

As next factor, there is the dispatch rider's service. Probably no field of military activity is exposed to greater opposition and external influence. For the burden of the transmission of information from the scouting detail to the reconnaissance detachment, and then from here to the higher command, does not rest on many shoulders. In individual cases, it rests only on the particular dispatch rider or wireless operator entrusted with this task.

The fate of entire formations may depend upon an important bit of information which a scouting detail has acquired through sacrificial effort, if it does not reach its destination in time. Horse-mounted, bicycle and motorcycle dispatch riders may be shot down or taken prisoner while on their way. A fall, or enemy interference, has prevented many a message from reaching its goal. Radio communication, which bridges great distances in reconnaissance work, is dependent on topography, surface and subterranean water courses, forests, hills, as well as on atmospheric disturbances. It is made difficult because of the need for transcribing of every radio message into required code, because of danger of being picked up. As many as 250 radio messages a day, for example, passed through my hands in Poland and also in France.

Reconnaissance is also seriously interfered with by the enemy when he will not let you see his hand, (as at cards). If no craft and trickery of the scouting detail or reconnaissance detachment is of further help, the reconnaissance officer is obliged to force the enemy to reveal his strength by battle. He does this by breaking through the enemy's weak screens, by avoiding his stronger formations, by keeping a position in front of the enemy or by pushing on toward him. A short excerpt from my daily work in Poland gives a good idea of the foregoing:

On 10 September, 1939, toward noon, a tank division had forced the retreat across the Narew river between the fortresses of Lomza and Osowiec and had broken through the enemy's front. While the break was being widened by severe infantry combat, my detachment drove through the gap and went southward toward Siedlce. After a 19-mile march, the scouting troops at the head of the column sent out the following message: "Zambrow is occupied by the enemy; go round in the direction of Siedlce." A few minutes later our own advanced columns attack the surprised enemy on the way out of the town and take the market place of the town of about 6,000 inhabitants. One hundred prisoners and antitank guns are the booty. The enemy, a whole battalion, slowly comes to its senses. The defense becomes stronger. Our detachment breaks off combat, and goes further in the direction ordered. A radio message to the division flashes through the ether "Zambrow strongly occupied by the enemy, must be cleared." Twenty minutes later we are on our way through other weakly occupied towns. The passage through these is forced by gun fire from motor vehicles. An auxiliary scouting detail under Lieutenant P. drives into a heavy forest to the right of the highway. The point has advanced even farther. Suddenly there is heavy machine-gun fire. Lieutenant P's scouts are forced into combat. The staff halts momentarily. Then all available officers and men of the staff go toward the nearby forest to reconnoiter. A short fight ensues. Several Polish officers and about thirty men are taken prisoners in the skirmish. The regiment is identified.

In the meantime, Lieutenant P. travels along the woods in his armored scout car, where the columns were resting, and explores the woods to a depth of about 2½ miles. He is about to turn around when several Polish officers spring out of the woods onto him. One of them makes ready a hand grenade. Lieutenant P. leans far out of his car as he turns, and, at three paces he sends a pistol bullet through the officer's breast. As quick as lightning, he pulls back into his car. The hand grenade goes off while still in the thrower's hand and tears him to pieces. The scouting detail returns safely. In the meantime, a radio command comes in from the division. A motorcycle rider, out of breath, brings it to me. It reads: "Direction of march no longer south, but east, in the direction of Brest-Litowsk." I order firing ceased. All rush to their cars. Prisoners and wounded are loaded onto trucks and sent to the rear. By radio, I guide the scouting detail some 18 miles farther toward the east. A new point is installed by me during the advance, the old one called in by radio. All is accomplished in the course of minutes. By exemplary cooperation of all officers, men and radio operators taking part in the operations, and with war's luck, great success is achieved. A new message flashes through space to the division: "Zazeby Woods-Wocholy; resting enemy columns of all arms, at least a regiment, regiment identified through prisoners." The reconnaissance goes on deep into enemy territory.

Reconnaissance must determine at once where important railway lines were blown up in the enemy's zone of operations, where the enemy's communication lines are destroyed, where bridges destroyed by the enemy have been repaired and numerous other difficult tasks.

Thus, by a night operation* under the daring Lieutenant P., in which railway tracks were blown up deep in the rear of the French East Army on the 15th of June, 1940, my reconnaissance detachment took possession of an important railway junction on the Saone by surprise attack against forces many times larger than ours. A whole infantry regiment was captured after a six-hour fight. Fifteen railway transports with over 500 cars and 50 locomotives fell into our hands.

I have endeavored, in this short description, to give an idea of the strenuous work of a reconnaissance detachment. Great was the part played by the reconnaissance detachment in the huge successes in all theaters of war.

*This night operation by "daring Lieutenant P" was not a reconnaissance mission but was a raid.—*Editor.*

Building a Bridge Across the Meuse West of Sedan for the Crossing of an Armored Division

[From an article by Lieutenant Grübnau, German Army, in *Militär-Wochenblatt*, 3 January 1941. Translated from the German in the Translation Section, the Army War College, Washington, D. C.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

In the evening of 12 May 1940, the Company Commander, 2d Company, 505th Engineer Battalion received brief, verbal orders as follows: "The Company will move to the Battalion assembly area in the woods north of Sedan. The Company will move out at my command (the Battalion Commander sketching situation and route of march on the map)." Meanwhile, other elements of the Battalion had moved up.

The company departed late in the evening. Complete darkness shortly settled over the countryside. The march led through Bouillon; sections of the town were in flames. Columns of trains were parked along the road, making the advance very difficult and causing frequent halts to be made. Since the vehicles had to proceed without lights, several collisions with oncoming vehicles were unavoidable and a number of radiators were damaged. However, the well-trained motor-repair detachment was able to repair the damage despite the darkness. The entire Company finally reached its designation in the early morning hours.

"Route of advance open." With this short report to the Battalion Commander, the Company lay down to rest.

After a brief rest, the Company Commander issued his orders: ". . . The Battalion is building a 16-ton bridge across the Meuse at Floing. The 2d Company will reconnoiter points suitable for ferries and proceed to construct them. We have at our disposal for the time being eight ponton wagons and one motor boat. The crossing will be undertaken without delay." The reconnaissance patrols moved out. It was still before noon, when they returned reporting as follows: "Friendly infantry has not yet gained the Meuse. Hostile artillery and infantry fire prohibits all reconnaissance." Meanwhile, our bombers and Stukas crossed overhead in an uninterrupted chain, searching for targets.

Around 1:30 PM, another patrol moved out to make contact with the forward infantry. It returned at 4:30 PM with promising reconnaissance results.

Meanwhile, the Company had made ready for the construction of a bridge—orders having been issued for the crossing of the Meuse—and mounted the vehicles of the 2d Bridge Section. Thanks to the assistance of the military police, the Company was able to move on without delay by 5:00 PM. Inasmuch as a part of the route of advance was exposed to hostile observation and covered by the harassing fire of hostile artillery, the Company Commander decided to advance by individual vehicles. Proceeding with extended distances between vehicles, the Company successfully crossed this "unpleasant" terrain without suffering any losses, despite a number of difficult spots along the road where it was necessary to detour around road demolitions.

The Company Commander drove ahead in order to designate the points at which ferries were to be constructed and to check the reconnaissance reports. Motorcycle messengers were posted at all forks in the road as guides for the ponton vehicles.

Considering that the reconnaissance had to be conducted under the fire of hostile machine guns concealed in bunkers, it was extremely successful. There was a perfectly level meadow with firm, dry soil and a good river bank, the conditions were favorable for ferry construction. The only objection was the lack of cover. The danger remained that the enemy might discover the presence of the many large vehicles and cover them with artillery fire.

Nevertheless, the designated vehicles arrived as early as 5:30 PM. We could plainly see the infantry crossing the river on their pneumatic rafts near Sedan. Our vehicles sped up. No long orders were required. The engineers jumped off their vehicles, uncoupled the ponton trailer, and immediately set to constructing ferries. It was astonishing with what ease the heavy bridge was put in place. A diving attack by hostile aircraft drove everybody under what little cover there was. Our nine light machine guns kept firing at the hostile planes as fast as the guns would permit. The bombs struck the ground far from us. The bridge construction went on without a letup. Now hostile artillery fire was added. Our antiaircraft defense, which had been reinforced in the meantime, drove off a hostile observation plane. Ap-

parently, the French were under the impression that we were building a bridge in a different location. Perhaps the hostile airplane got on the beam of our radio station which was operating some distance from us. The shells came within 50 yards of our location, striking the ground in our front and rear as well as on both flanks. We were completely boxed in by the barrage. Two hostile batteries, determined to wipe us out, were plainly visible. Fortunately, as subsequent investigation showed, the village of Glaire, with its gardens, on the other bank of the Meuse prohibited any observed fire. In the record time of 38 minutes, the first 17-ton ferry and its motor tug were ready for operation.

Other vehicles with bridge equipage followed. The 2d Bridge Company, 505th Engineer Battalion, and the Bridge Company of the 37th Engineer Battalion were ordered up by radio. Another company each of the 505th and 37th Engineer Battalions moved up to help bridging the more than 230 feet of water.

Meanwhile the first ferry was in operation, carrying across the river a steady flow of guns, armored cars, tanks, antiaircraft machine guns, and trucks. About an hour later, the Company had completed its second ferry. The two ferries were coupled together; this served greatly to speed the process of ferrying materiel across the river (every single minute lost in crossing the river being a loss of miles in the offensive and advance). Some distance upstream, troops were still engaged in crossing the river by pneumatic rafts. The abutment sections, one span each, were now put into place. The steep bank on the near side of the river made it necessary to support the spans by rails placed on top of them. Trestle spans were not used, because of the experience gained at a nearby bridge where the trestles had lost their footing, and time-consuming repairs were required, which caused a delay in the transfer of the troops.

By 11:30 PM—it was quite dark by that time—several coupled ferries were moved into place by means of tugs. The bridge was completed shortly after midnight. There was an immediate rush of traffic for the bridge. The road was so crowded that two-way traffic was impossible. Casualties from the front had to be taken to our battalion collecting station in the cloth factory near the bridge. In addition to the many German casualties, there were 200 wounded of the enemy who needed care. Removal of the wounded to the rear was out of the question for the time being.

Column upon column now moved across the river in close order. A ponton foot bridge was erected farther upstream and used for the crossing of motorcycle elements. Every minute had to be exploited. For the time being, the Battalion Commander, himself, took charge of handling the traffic at the bridge, urging the stream of traffic to move on and taking drastic steps at any sign of delay. The bridge was used not only by our own division. Our bridge being completed much earlier than those of the adjoining divisions, some of the neighboring elements moved over and squeezed into the line passing over our bridge.

The Company remained at that place for several days, taking advantage of the time to move up auxiliary material and joining the other two companies of the Battalion in preparing for the construction of a 20-ton bridge. A bridge construction company took over the job of erecting the bridge. A platoon of our company placed a 16-ton ferry just below the bridge to take care of less important traffic moving in the opposite direction.

The 20-mm antiaircraft guns protecting the bridge were most successful and drove back nearly all hostile aircraft with losses. Not a single bomb scored a hit on the bridge or struck anywhere near it.

The 20-ton bridge was completed by May 18, 1940. The Battalion immediately proceeded to remove its 16-ton military bridge and moved on to new and difficult assignments.

The Home Guard

[From an article in *The Tank*, February, 1941, a monthly for the Royal Armored Corps, England.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

The story of how the Home Guard became a fully recognized part of the British Army is almost without parallel in the history of Great Britain or any other country.

First called the Local Defense Volunteers, they were formed in the days preceding the evacuation from Dunkirk, days presenting a peril more menacing and formidable than since the days of Napoleon. One night in mid-May, the Secretary of State broadcast an appeal for unpaid volunteers to enroll at local police stations and to form little companies in every village, town and factory for defense against attacks by parachutists and Fifth Column traitors. In the veterans of the Great War of 1914-18, it was felt, would be a nucleus for a Home Guard. All were over 45 years of age. Their military knowledge and experience had not been put to use.

In overwhelming numbers, these veterans called police stations, eager to join the new force. Not notified in advance, police stations were taken by surprise. No instructions had been issued. Despite this, Home Guard enrollees numbered more than a million within a few weeks. Not all were fully armed and equipped, nor could be for some time.

The existence of the Home Guard must have acted as a deterrent to the German intention to invade this country. Threats were made by the German propaganda service of what would happen to members of the Home Guard if they fell into their hands.

At first the Home Guard members served without pay; sometimes were actually out of pocket. Most of them were in full day-time employment, in essential war work, men with home ties and family responsibilities. Delays in the supply of arms, ammunition and uniforms were the most irksome of their early experiences.

Many soon found that a vigilant and suspicious Home Guardsman was not to be trifled with. Some Royal Air Force pilots, bailing out from their machines, could afford personal testimony of the Home Guard's watchful omnipresence, as could enemy air crews who fell into its hands throughout the Battle for Britain.

Besides watching for and picking up hostile parachutists, the Home Guard's role was also to free the Regular Army for active defense and counteroffensive work against any enemy landing in force by relieving it of the tasks of local vigilance and defense, which would have necessitated its being scattered in little isolated parties all over the country, and thus being weak everywhere. The erection and manning of local defenses, the constant patrolling of streets and roads and railways, the occupation of vantage points, the safeguarding of Government offices, war factories, vital industrial and communication points—all these fell within the Home Guard's sphere of responsibility.

More and more as time goes on, the task of safeguard against invasion will be taken over by the Home Guard. To fit it more fully and adequately for this duty, a complete reorganization is announced. Its local character has given it strength and popularity. This is to be preserved, but a new central system of administration has been set up under control of a Director General, General Eastwood. Greater opportunities are to be given for specialized training, required if the Home Guard is to fulfill its new and enlarged role. Home Guard officers were placed on equal footing with officers of the other armed forces of the Crown by being given King's commissions. Financial reforms do away with personal out of pocket expenses for transport, or food and lodging of Home Guardsmen when on duty.

The Home Guard now takes a recognized and honoured place among the armed forces of the Crown. At the end of the war the individual Home Guardsman will have the consciousness of duty well done and knowledge that he did not fail his country in her hour of greatest peril and need.

Parachute Troops

[From an article by Colonel F. Stuhlmann, German Army, in *Militär-Wochenblatt*, 20 December 1940. Translated from the German in the Translation Section, the Army War College, Washington, D. C.]

Condensed by COLONEL F. M. BARROWS, *Field Artillery*

The parachute attracted little attention until aviation began to develop and the airplane was invented. Its importance was emphasized especially in the years from 1912 to 1914, when a number of successful parachute jumps from airplanes were recorded. Initially, the parachute was adopted as a life saver for crews of lighter-than-air ships. Airplane crews did not resort to its use until the later years of the World War, as the number of casualties among airplanes increased with the intensification of aerial combat.

After the World War, the development of the parachute was carried on in the United States of America. As early as 1919, a parachute built by an American, by the name of Irvin, was chosen as the most suitable type after exhaustive tests. While men in various countries imitated that parachute and improved its design, the use of the parachute for a number of years was confined mainly to the United States, where, besides numerous public exhibitions, the Army trained personnel in parachute jumping.

Once the idea was developed, Soviet Russia seized upon it and exploited it to the full. Beginning, in 1932, with training young people in the use of the parachute, the Soviet Government spread the enthusiasm for the new sport to wide sections of the populace. Eventually, parachute jumping was introduced also in the Red Army. Tests on a large scale were made during the maneuvers which the Red Army held at Kiev, in 1935. The experiment attracted such great attention that all other military nations set to work on the same idea.

A new arm, parachute troops, was created. Combined with air infantry, parachute troops constitute the so-called air-landing force, that is, an armed force which is transported to its zone of employment by air. Whereas in the case of air infantry the personnel and equipment are carried by aircraft and the airplane lands in order to deposit the air infantry, parachute troops consist of individual soldiers and detachments which reach the scene of action by jumping from the airplane with the aid of the parachute.

Individual cases have been recorded in the history of the first World War, where parachute jumps were made in the execution of some special assignment; however, there is no record of any major operations of that nature. On the basis of the success achieved in the use of the parachute, General Mitchell of the United States Army Air Corps, in 1918, proposed an operation in which a division, equipped with arms, ammunition and provisions, would be dropped by parachute behind the German lines. Launching a simultaneous attack in front, the plan was to crush the German lines by the bilateral offensive. However, the lack of practical experience caused the execution of the plan to be postponed until 1919, by which time the war had come to an end.

In Germany, parachute troops were organized in 1935. They are employed individually, by units as well as by special detachments. The employment of the individual parachute trooper is the exception and limited to reconnaissances for special missions and for the transmission and collection of communications. Far more frequent and important is the employment of parachute troops by units or separate detachments. The nature of their action is highly varied; it is directed against hostile lines of communication and vital installations. Special assignments of parachute troops consist in surprise assaults on the flank and rear of the opponent, on special types of defenses, bridges and so forth. Parachute troops can go into action immediately upon landing, for the action is carefully rehearsed and all necessary instructions are issued in advance with the aid of maps and sketches. Thus the action of parachute troops may be carried far into the rear areas of the opponent; combined with the operations in the combat zone, it promises great results. In addition to the employment of parachute troops, the parachute may be used also for the purpose of depositing vehicles, ammunition, provisions and other equipment. Covering aircraft, consisting of bombers and pursuit ships, are held in readiness and committed to action against hostile aircraft prior to, during and after the landing of parachute troops.

The parachute trooper requires thorough training for the execution of his many functions. The prospective parachute trooper must be a volunteer; he must be an athletic type and of sound physique; he must be aggressive, energetic and intelligent. His practical and theoretical training go

hand in hand. The practical training includes training in marksmanship, combat engineering and signal communication. At the parachute school, the soldier receives training in gymnastics and practices jumps with the aid of the parachute and special ground equipment. The student also goes on flights as a passenger, in order to grow accustomed to flying. He does not jump from a plane in flight until he has met all of these physical and mental requirements. The first jump is followed by others made individually and collectively, from different altitudes and at various wind velocities. The training of the parachute trooper is concluded with combat and unit exercises. The main requirement is that the parachute trooper must suffer no injury in landing, but must be fit for combat so that he may execute his combat mission—which is his main function—after reaching the ground.

German parachute troops participated in the campaigns of 1939 and 1940; they were highly successful in the operations in Poland, Belgium and Holland. While other nations likewise have organized parachute troops, no report has been published on their employment.

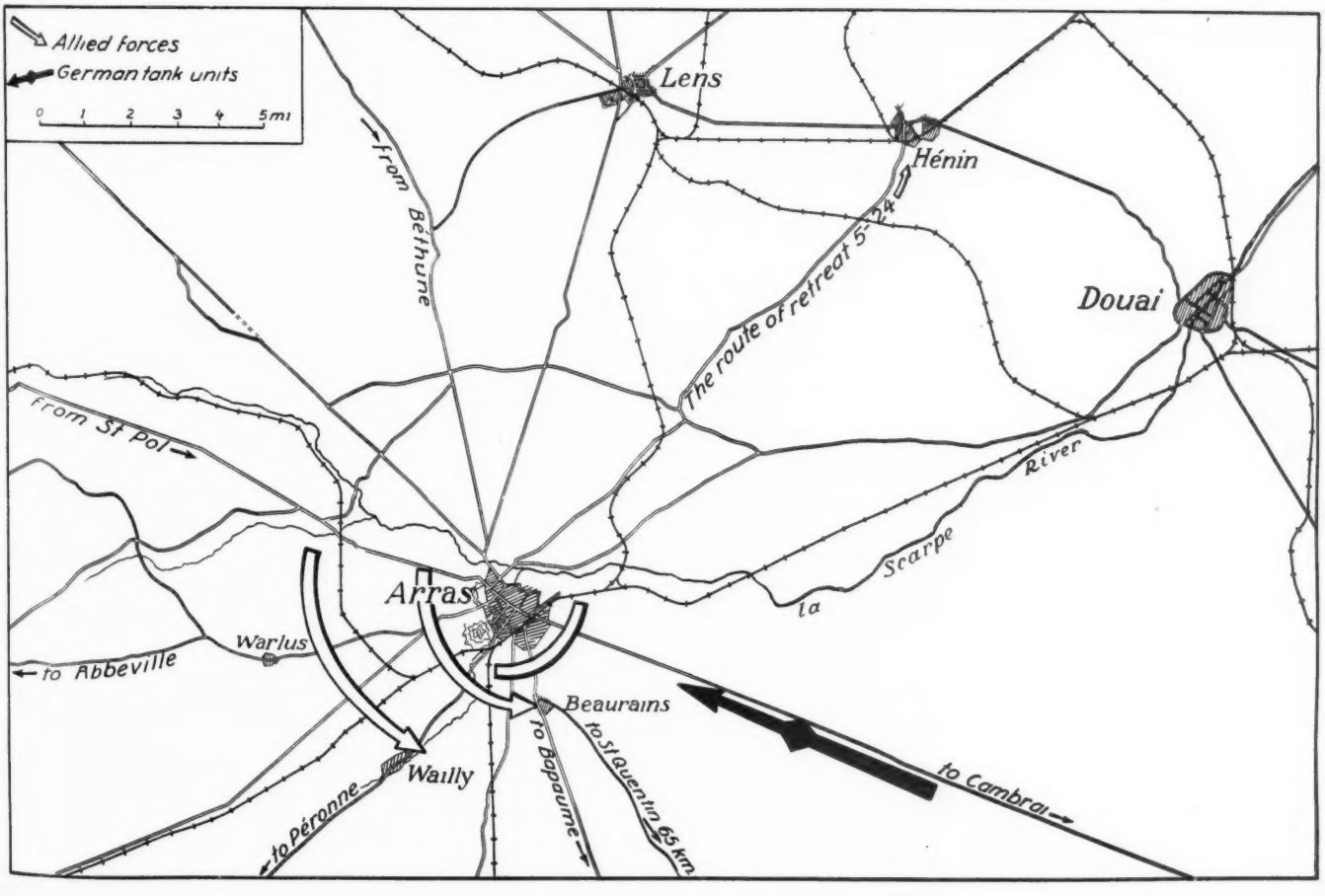
At any rate, an arm has been created with the organization of parachute troops which must be given due consideration in any circumstances. It furnishes the high command a most valuable means of carrying out certain vital missions in the combat zone as well as in the rear areas.

The Battle for Arras

["Bor'ba za Arras." Translated from the Russian by Lieutenant Joseph Dasher, ORC, from *Krasnaya Zvyezda*, 22 November 1940.]

The story of the battle of Arras begins on 18 May, when enemy tanks were already near St. Quentin. The decision to retreat was maturing at the Headquarters of the British Expeditionary Corps at Arras. General Gort with his field staff was already in Belgium. The defense of Arras was entrusted to General Petret, who was called for this purpose from Abbeville, where he was at the Headquarters of the 12th Division.

A small number of troops, which were stationed in this region, was distributed so as to offer best resistance to the Germans. The 36th Infantry Brigade (which later was crushed by the Germans) was placed at Doullens for the de-



fense of the rear zone. One battalion was detailed for the guarding of the Somme crossings, at Péronne. Two brigades of the 23d Territorial Division were distributed along the du Nord Canal for meeting the enemy, who was advancing into the 30-kilometer wide gap between Allied units.

For the defense of the city proper there remained: one battalion of Welsh Guards, several small mixed units including engineer and supply units, and a French tank division in a rather shabby state. Save for the British guards these forces were poorly trained.

General Petret established his headquarters in the ancient St. Waast castle, whose cellars were ideal as air raid shelters. To aid him he received only two staff officers and a codifier. There was a total lack of clerks, and the liaison means were limited to two messenger orderlies and a radio receiving set. General Petret had practically no contact with the GHQ.

By then the city's population fell to 3,000, all of them hiding in air raid shelters or in the famous Arras caverns, formed by quarry operations.

The forces defending the city were situated to the south and east, behind hastily constructed fortifications.

Beginning on 20 May, violent battles developed, accompanied by frequent air raids by German dive bombers which were causing heavy damage. The enemy pressure was so strong that General Petret was compelled to issue an order to retire to the line of the railroad station.

The entire space before the station was transformed into a rubbish heap of destroyed railroad cars and locomotives. The switch house was blown up, and the hollow through which seven railroad tracks were laid near the station, became an impassable antitank obstacle. Behind this hollow, and also in the houses standing near the station, the British garrison took up its new defensive positions.

The enemy conducted a whole series of heavy air raids, unloading mostly incendiary bombs. Fires broke out, but due to the lack of wind the fires only smoldered. The city became covered with a shroud of black smoke. On 22 May the pressure on Arras increased still further, and General Gort decided to organize a counterattack for dual purpose.

Firstly, it was necessary to effect a junction with the French in the south, who, apparently, were intending to begin the long awaited counterattack in the northerly direction. Secondly, the command was hoping thus to relieve the situation of the Arras garrison.

This mission was entrusted to the commander of the 50th Division, General Martel, who was to employ for the counterattack one of his brigades and a tank brigade assigned to him.

General Martel received the order to move to a point approximately 15 kilometers to the southeast of Arras. For this it was necessary to split his forces into two columns, advancing parallel to each other, at a distance of several kilometers. Each column was formed as follows: infantry battalion, tank battalion, field battery, machine-gun company, antitank battery.

In its initial stage the battle was developing very successfully. The left column was doing excellently, disabling a great number of enemy tanks and capturing 400 prisoners. The Germans suffered a great many casualties in men killed. The right column at first also advanced somewhat, but then it was stopped by strong enemy forces and in addition, this column was placed in a difficult situation by the confused action of the French armored division, which mistook the British forces for the Germans and opened fire against the former.

At 6:00 PM on 22 May, it became evident that further advance is impossible. Reconnaissance had discovered that German reinforcements, consisting of motorized infantry and tank units, are moving up along the road from Cambrai. A part of the advancing enemy forces was destroyed by fire. Strong counterattacks were made from the region of antitank fortifications, organized by both British columns at Beaurains and Warlus. However, the pressure upon the Allied forces was becoming ever stronger. Simultaneously the enemy made a number of efforts to effect a crossing of the la Scarpe river.

Due to the numerical superiorty of the enemy both columns began retreating to the north of the city. The forces of General Petret began to realize that they will not be able to hold Arras much longer. In a situation such as existed at Arras, with the greater part of the city in flames, and with the hourly dive bombing attacks, the defense was becoming increasingly difficult. German units had already reached the suburbs and there was some talk of organizing the final stand at the railroad station.

At 1:30 AM on 24 May a messenger from General Gort brought to General Petret the order to retreat. Only two hours remained before dawn, but the evacuation of the city took place in the fullest order. The units began retreating along the road to Douai; however just outside the limits of Arras it was found that the bridge across the la Scarpe river was prematurely blown up. At first this was regarded as a disaster. Later, however, this was found to be extremely fortunate because a reconnaissance detail consisting of some 20 men, which had crossed the river over the demolished bridge, had been captured by the Germans who had arranged an ambush on this very road. Thereupon, the retreating units were transferred to the only remaining road leading to Henin. By then the Germans had completely encircled Arras.

During the whole morning the units of General Petret, together with the remains of the 5th and 50th Divisions, were moving in a solid mass along this narrow road. Thanks to a turn of good luck there was not one German plane to be seen in the sky and the British units reached the region north of Douai without losses.

Changes In Air Tactics

[From an article in *The Aeroplane* (Great Britain), 28 February 1941.]

Condensed by CAPTAIN O. C. MICHELMANN, *Military Intelligence*

Following a year of large-scale air action, great and fundamental lessons have been learned in the equipment and employment of fighters and light and medium bombers. Heavy bombers have not yet shown their powers, although the new four-motor Short Stirling bombers of the Royal Air Force were in action for the first time some nights ago.

Chief lessons learned with fighters is the need for adequate defensive armor, for protected fuel tanks, for cockpit heating, for windscreen de-icing, for quick means of escape by parachute and for more performance at height.

The standard British armament of eight machine guns has proved its effectiveness. But now that enemy bombers are piling on the armour, cannon have proved a welcome addition to the armament. The cannon now used by our fighters are superior to those of the enemy, who appears to be moving towards heavier armaments of machine guns on fighters. With both forms of armament there is an urgent demand for greater quantities of ammuntion to be carried for each gun.

The light bombers, which include the Blenheims, have done magnificent service. Had they twice the speed, the escorts could be abandoned. Armament in the really fast day bomber is of secondary importance and might even be removed altogether.

The medium bomber has taught more lessons than any other type. The Hampden, the Whitley and the Wellington have no equal in their class. Original tactics developed for them on the experience of 1918 have had to be drastically revised. Both the Whitley and the Wellington are heavily defended with power-operated multi-gun turrets. The Wellingtons, in particular, took heavy toll of enemy fighters by day over the Heligoland Bight.

Nevertheless, daylight operations over enemy territory by even such well-defended bombers flying in protective formation proved too costly. Thus the medium bombers were turned over to night operations.

Experience suggests that for night work at present little defensive armament is needed although the improvement of the night fighter may modify this opinion. If heavy bombers are to be used by day, their armament must be greater than anything yet seen used for defensive purposes. Now that cannon are being adopted generally as offensive weapons in fighters, they may possibly be found in the defensive armament of bombers. In America a cannon has been designed for use from a hand-operated turret. In our own hydraulically and electrically operated turrets they should be still more effective. The Germans are fitting an electrically controlled turret into newer types.

Experience seems to lead to bigger, heavier, higher-powered fighters, to smaller, faster and more lightly armed or unarmed day bombers, to fast medium bombers armed much with the same weight of fire as our Wellingtons today for use at night, and towards the heavy bomber designed for both day and night operations and armed with numerous gun turrets possibly equipped with cannon.

Apart from these considerations of offense and defense, our own greatest need at the moment is the development of engines rated at still greater heights. The enemy has a slight advantage in his fuel injection system.

The war shows that no single type of aeroplane can be kept severely to one category of duty, however specialized its design. For instance, Hawker Hurricanes have been used as day and night fighters, short-range interceptors, long-range escort machines, and flown from aerodromes from Norway to Egypt. Versatility is the essence of good aircraft design. Our machines hold an advantage in this particular, despite Messerschmitts modified for bomb carrying.

Meeting Engagements of Tanks in the Strategical Depth of the Enemy

[An excerpt from an article by Colonel I. Ziberov in *Krasnaya Zvyezda*, 27 December 1940. Translated from the Russian in the Translation Section, the Army War College, Washington, D. C.]

The particular depth involved in the immediate mission of the unit in a meeting engagement is determined by the situation. As was demonstrated in the battles of the West, it will not always be possible to destroy an encountered hostile mechanized force by means of a single assault. A part of the hostile defeated forces might well execute a hasty withdrawal from the battlefield.

This was the case, for example, on May 19, 1940, when at the historical battleground of 1917 between La Cateau and Cambrai, a German tank unit attacked a light motorized and mechanized division of the French. About one thousand French machines were left on the battlefield: disabled, damaged or abandoned by their crews. And yet, in spite of the power of the 400 to 500 assault tanks, over half of the armored and auxiliary machines of the division, escaped destruction. This took place where the Germans had an obvious superiority in tank forces over the light French units. In action against a stronger enemy the latter, in the case of failure, may often preserve and remove units from the hostile threat of destruction in a state of complete readiness for action.

In the circumstances, an immediate pursuit must be launched—both a frontal and especially a parallel pursuit. During this phase, the battalion commanders must manifest their utmost initiative of action. The faster battalions must be utilized along the parallel roads. The mission of these battalions is to reach the head of the withdrawing units, to halt their movement, envelop and destroy them—operating in conjunction with the tanks following on the heels of the enemy. These battalions must attack boldly on the reversed front.

In the control of tanks in the cases above cited, in a meeting engagement with a mobile enemy, the time for the issuance of instructions is greatly limited. Wide use is made of special instructions and brief radio signals.

The commander of the tank unit will find it possible to assign personally his mission to only one organization commander, the one who proceeds in the same column with him. The remaining organizations will receive their orders through the headquarters of the unit—staff officers delivering these to the organizations concerned by visiting them, or through liaison personnel. Orders for the attack issued to commanders of organizations marching over other routes must always be verified by radio or by scout plane. Battalion commanders may frequently designate their own attack objectives. In the event of a surprise action, objectives are designated by signal over the radio, which must at once be verified by dispatching liaison personnel or staff officers by motor.

Every order, signal or command must be brief, succinct and clear. The speed of the maneuver and the swiftness of the tank action complicate any changes in designated missions. A clear plan of action, proper understanding of the combat mission by the officers and men, wide initiative in following the spirit of the concept of the senior commander, incessant reconnaissance, thorough and efficient communications throughout, prompt adoption of plans and the prompt transmission of these to the organizations concerned—all this is vital for the efficient control of tanks in meeting engagements.

The commander of the larger tank unit must endeavor to exercise control over his tank formations from his command post, changing position to keep up with the progress of his forces by bounds. The headquarters operations section remains with the unit commander. During critical phases of the battle the unit (or organization) commander must be prepared to get at the head of his organization and to lead it personally in the decisive attack.

Academic Notes

Current School Material, Which Affects Instructional Procedure or Tactical Doctrines

---

COLONEL K. B. EDMUNDS, Cavalry, *Acting Commandant*
COLONEL M. C. SHALLENBERGER, Infantry, *Acting Assistant Commandant*
LIEUTENANT COLONEL D. C. SCHMAHL, Field Artillery, *Secretary*

CHIEFS OF SECTIONS

Command Section	LIEUTENANT COLONEL C. D. Y. OSTROM, *Coast Artillery Corps*
Administrative Section	LIEUTENANT COLONEL A. P. THAYER, *Cavalry*
G-1 Section, Personnel	LIEUTENANT COLONEL W. A. COPTHORNE, *Chemical Warfare Service*
G-2 Section, Military Intelligence	LIEUTENANT COLONEL R. L. BURNELL, *Field Artillery*
G-3 Section, Operations and Training	LIEUTENANT COLONEL P. A. HODGSON, *Corps of Engineers*
G-4 Section, Supply and Evacuation	LIEUTENANT COLONEL T. M. CHAMBLISS, *Infantry*
Extension Courses	LIEUTENANT COLONEL A. J. MCFARLAND, *Infantry*

Antimechanized Defense

Comments at the Conclusion of a Map Exercise at the Command and General Staff School

By
Colonel K. B. Edmunds, *Cavalry*

You have been listening to what I consider a very able and thorough presentation of the application of our doctrine on antimechanized defense. That is what these map exercises do—take our doctrine as expressed in Field Service Regulations and apply it to specific situations. If my remarks appear to be critical at times, it is not the committee that is being criticized. They took our doctrine as it exists and applied it to a situation. That is what they were required to do, and they did it well.

I wish to speak about the doctrine of antimechanized defense, to give you an idea of the theories behind it. You are the ones who in a few years will be doing the work and formulating the theories. What I have to tell you is for your use in doing this, not to influence you toward any particular line of action.

In formulating doctrine we try to base it as far as possible on experience. We inquire what has been done in war and adopt the procedure which is known to have brought success. But sometimes that is not possible. It was not possible in the case of antimechanized defense because there has been no example of successful antimechanized defense. No one yet has stopped the blitzkrieg. What attempts were made were failures. Obviously, it would be a mistake to base our doctrine on failure.

So our doctrine on antimechanized defense had to be based on pure speculation—educated speculation, of course, but still theory untested by experiment. There is great danger in this; I could quote you many cases where theory evolved in such a way has proved wrong when it met the test of battle. But we must have *some* doctrine on which to base the training of our troops and in this case no other method was feasible.

Now when a man starts thinking on such detached, philosophic lines without a concrete example to quote he is more than likely to be influenced by his background of experience and training. He turns to the things he is familiar with. An engineer presented with the problem will think of obstacles and mines. An artilleryman will think of the fire of cannon. An infantryman or cavalryman will first consider movement, maneuver, shock, because that is the way he was brought up to think.

But as a result of the different mentalities that have been brought to bear on the question, our present doctrine contains *all* these ideas. It is a compromise and open to the weaknesses of all compromises. There is a conflict. To make the matter easier, I can reduce these ideas to two.

The first, which for this discussion I shall call the *passive* method, counts on canalizing the mechanized attack through the use of natural and artificial obstacles; then, in the channels so made, meeting and repulsing it by the assembly of heavy concentrations of antitank weapons. It leans heavily on natural obstacles, selecting positions whenever possible behind such obstacles. In order to hamper the maneuver of the attacker, it limits also the maneuver of the defense both in front of the position and within the position. I believe that I will not be wrong in saying that this idea is French in origin.

The second theory, which we may call the *active* method, counts on using only so many passive means as are necessary to delay the attack and disorganize it, depending on counterattack to defeat it and expel or destroy the troops engaged in it. In effect, it meets the mechanized attack by a mechanized counterattack, or by a combined mechanized and foot counterattack. It states that obstacles and fire alone have never stopped any determined offensive, that the blitzkrieg has swept successively over the defended Vistula, the Meuse, the Somme, and the Aisne, that even the Maginot Line behind the Rhine has been broken, and that all this was the result of a lack of active and energetic counter measures.

Now you may say, why not use both methods to the limit as our present tentative FSR contemplates? But there are certain objections to this idea. The figures which I will quote are a summary of those prepared at my request by the committee. The paper they are taken from I consider most interesting and it will be filed for future reference with this problem. In the Army area we are considering there would be constructed 369,400 yards of barriers and mine fields—over 200 miles—with the expenditure of 263,000 man-hours of labor. Of this immense amount of construction, only a fraction—the portion actually encountered by the attacking armored force—functioned in the defense. It looks like a considerable amount of this work was wasted.

On the army front and on the battle position there were approximately 128 37-mm guns and 160 .50 cal machine guns used *exclusively* for the defense of these obstacles. Of these, as the situation was developed with the Red infantry leading, it is estimated that about 16 37-mm and a few .50 cal machine guns actually fired at tanks.

I have not the time to quote any more figures, but you can see that only those battalion, regimental and division weapons, whose units were in the path of the mechanized attack, plus the antitank weapons of reserves, plus the artillery antitank weapons whose units were in the path of the Red armored force, could have been used for the purpose for which they are designed, and that the total so used is only a fraction of the antimechanized means of the army. In other words we oppose concentration of effort in the attack with dispersion of effort in the defense, a violation of one of the fundamental principles of war.

Again, all these barriers and antitank weapons are strictly specialized for one particular purpose. They are of no use in supporting the attack of their units and in defense are employed against only one of the enemy's means, or are not employed at all. Of all the antitank weapons in this army, literally hundreds, not one fired to defend the battle

position against the Red infantry attack. Our doctrine forbids it; they are to be kept silent until an enemy tank appears. Once more we have a violation of one of the basic principles of war which is that *all* means should be used in coordinated effort for the attainment of the objective of the whole.

So you will find the advocate of the active theory—the theory of defense by counterattack—limiting the passive means to those necessary for the defense of the position and for flank protection. He will admit that these are necessary and will admit also, that for reasons of morale, it is necessary that foot troops have means to defend themselves against tanks. The position must be such that it will delay the attack long enough for the reserve to be maneuvered into position and will disorganize the enemy's advancing troops sufficiently to give the reserves the superiority necessary for a successful counterattack. Any fire power remaining after the needs of the battle position are met should not be frittered away piecemeal to defend successive barrier lines, but should be massed to support the counterattack.

A considerable amount both of ground organization and antitank weapons are necessary for these purposes, but the active theory would dispense with successive echelons of obstacles and guns to a depth of many miles, devoting all means to strengthening the general reserve, and particularly the armored force. For on the defensive the armored force can concentrate *all* its efforts against the enemy, not just a part, and on the offensive can also be used to great effect toward the attainment of the objective.

In fact, if our armored force is sufficiently strong to have a definite superiority over similar troops of any possible opponent—an objective which, with our manufacturing facilities, is well within our reach—it is improbable that our unarmored troops will ever have to withstand a concentrated mechanized attack.

A complete application of these ideas would leave the antimechanized means with units to include the regiment for local defense and to hold the position. All other means would be held in general reserve for maneuver. Obstacles would be utilized and improved for the defense of the position and flanks only, the ground in rear of the position being left clear for the maneuver of reserves.

Another question which might be considered is the advisability of giving antitank guns a secondary mission of supporting their units against any type of opponent. Such a decision would involve the provision of additional ammunition and types of ammunition.

On the other hand, the advocate of passive methods argues that antitank guns are as mobile as the tanks, can be maneuvered and concentrated as quickly, are much cheaper than tanks and, in conjunction with barriers, can defeat an armored force.

That is sufficient to give you an intelligent idea of the two conflicting theories regarding defense against mechanization. Some day the question must be decided; some of you may have a voice in the decision. Shall we concentrate on obstacles, mines and cannon; shall we rather use our money and energy to build up an armored force superior to that of any possible opponent; or shall we compromise and try to do both?

Armored Units, Armament, Organization, and Characteristics

Delivered to the Students of the Command and General Staff School in May, 1941

By

Lieutenant Colonel V. W. B. Wales, *Cavalry*

Blitzkrieg.—Gentlemen, what is blitzkrieg? Does it involve any new principle of war? Is the astounding German success the result of superior military genius or is it merely the normal result of their preparedness for war? In my conference this morning on the armament, organization and characteristics of the armored division I believe that the answer to these questions will be self-evident.

General Employment.—It is axiomatic that any branch, arm or service of our Army should be employed in battle according to its capabilities and limitations. This does not mean its *theoretical* capabilities and limitations but it does mean its *actual* capabilities and limitations at the time of its employment considering the terrain, weather conditions and all other factors which enter the picture. At one time, and under certain conditions, a force may be able to accomplish a particular mission whereas at another time, it might have great difficulty.

We are all agreed that under all conditions of weather and terrain the infantry still remains the "Queen of Battles." This follows logically from the fact that the Infantry is designed, equipped and organized to take and hold ground from the enemy which is *the* essential requisite for winning battles; and hence, for winning wars. Also it *can* operate at all times under practically all conditions. Other arms, branches and services are organized, equipped and designed to augment or supply the infantry with the necessary additional capabilities and means to accomplish its mission, i.e., the defeat of the hostile military machine.

All branches, arms and services are essential to a well balanced team, all are important in our military system and

all must be employed to further the Infantry success if a war is to be won against a powerful, determined enemy. However, and keep this in mind please, *this assistance may be with the Infantry itself or far from the main battlefield.*

I would like to express another idea in this short introduction, namely: it is not sufficient to pattern our doctrines, organization, training and tactics after those adopted by any other nation. We have to base our solution on our national characteristics, economic situation and on the principles of war and doctrines that have been developed in our own service. It is not enough to be equal—we must be *superior.* This calls for original thought, initiative on the part of all military personnel and constant study and experimentation.

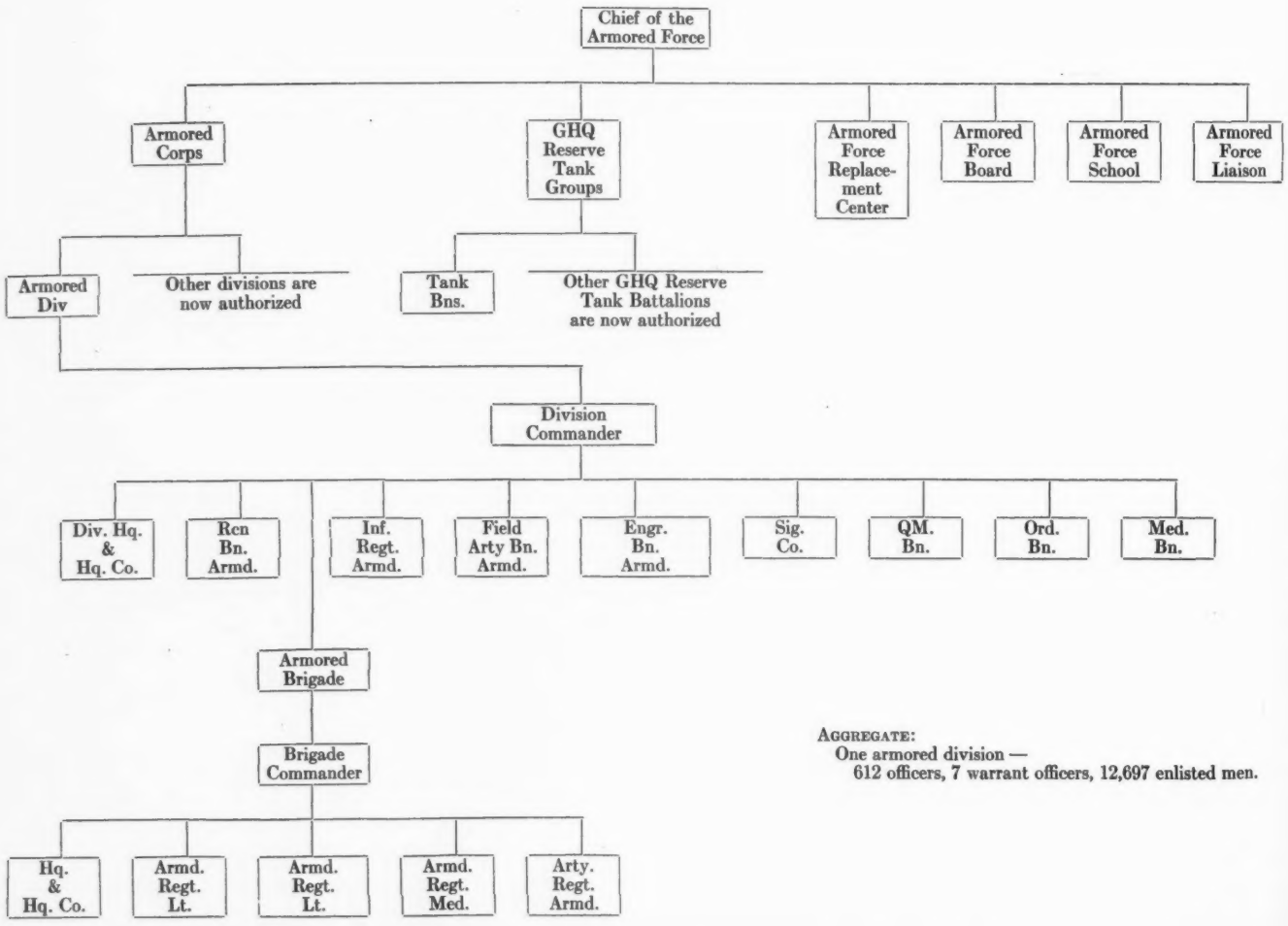
About five or six years ago, General von Schell, then a Colonel of the German General Staff, visited Fort Knox and Fort Benning, saw everything there was to see regarding mechanization, and carried back to Germany the doctrines and tactics that we had developed. Recently these were applied with modifications and additions, in the defeat of Poland, Norway, Belgium, The Netherlands, France, Yugoslavia and Greece. However, our improvement in tank tactics and technique has been remarkable and today, I believe our equipment, such of it as we have, is superior and our tactics and technique are better than those of any other nation.

ORGANIZATION.—The organization of the armored division is quite different from that of other divisions. Whether or not it is the best organization that we can get I am not prepared to say. On the one hand it is a deviation from our accepted ideas on the subject, but, on the other hand, the success of the similarly constituted panzer divisions in battle is an excellent argument in its favor. In any case, a study is now being made on the subject. "The armored division is organized primarily to perform missions that require great protected mobility and firepower. It is given missions decisive in character. It is capable of engaging in all forms of combat, but its *primary role is in offensive operations* against tactical or strategical objectives *deep in the hostile rear.*

You will note that there are two distinct types of tank units, the first is the armored division with missions appropriate to its organization, its mobility and combat power; the second is the GHQ reserve tank battalion whose primary mission is the close support of infantry. The secondary role is found in supplementing tank units of armored divisions and in replacing battle casualties in those divisions. The doctrine for the employment of the latter is now in process of formulation.

The armored division comprises five echelons; command, reconnaissance, striking, support, and service. A brief description of each follows.

ORGANIZATION OF THE ARMORED FORCE



AGGREGATE:
One armored division —
612 officers, 7 warrant officers, 12,697 enlisted men.

The command echelon is for control and direction of the operations of the division at all times and under all circumstances. Besides the commanding general it includes the means for putting his decisions into effect. Ordinarily it is divided into a forward echelon called the Command Post and a rear echelon. In the former are the personnel and material needed for purely tactical operations—in the latter are found the supply and administrative sections. The former is habitually well forward and the latter, where best they can perform their duties, generally in rear of the division. In the field, personnel of the forward echelon ride mainly in scout cars.

The reconnaissance echelon, as its name implies, is for reconnaissance. It consists of a headquarters and headquarters detachment, 2 armored reconnaissance companies of 22 scout cars and 19 motorcycles and 11 tricycles each, an armored company, light, of 13 tanks, 4 motorcycles and 2 tricycles and an attached medical detachment. I understand that the tricycles will be replaced by bantam cars although I have nothing official on it. The battalion has considerable firepower, including 86 machine guns cal .30 light, 128 machine guns cal .30 heavy, 64 machine guns cal .50 (HB), 161 sub-machine guns, 3 60-mm mortars and 13 37-mm guns.

The striking echelon consists of a brigade of 2 regiments of light tanks, a regiment of medium tanks and a regiment of 105-mm howitzers. The light tank regiments are composed of three battalions of three companies each, a headquarters company, a machine-gun company, a reconnaissance company and a service company. The medium tank regiment has two battalions of three companies each, a headquarters and band and headquarters company, and a service company. You will note that the machine gun company and the reconnaissance company of the light regiment is not included. In the brigade there are a brigade headquarters and headquarters company. Total number of tanks light is 260, tanks medium is 108.

The support echelon includes a regiment of armored infantry, and a field artillery battalion. The personnel of the infantry regiment rides in half-track (light armored motor vehicles) and the artillery battalion rides in the prime movers which are half-tracks and in additional half-tracks. This support echelon is for the support of the striking echelon and supplies holding powers that the striking force does not have.

The service echelon consists of the quartermaster battalion, the ordnance battalion, and the medical battalion.

The engineer battalion, a part of the support echelon, and the signal company, a part of the command echelon, may operate as a whole, or in part, with the other echelons as the situation demands. These two organizations have a large number of special vehicles from a cross-country ambulance to a machine shop truck.

Their main mission is to provide the means for the division to make a sustained effort in combat.

CAPABILITIES AND LIMITATIONS.—Recent operations in Yugoslavia and Greece seem to prove that mountainous terrain is not such a barrier to tank operations as had previously been believed. Desert sand also appears to be suitable for tanks. The Russian-Finnish War proved tanks can operate in extreme cold. Reports from many and varied sources indicate that bombing has little material effect on tanks, but is dangerous to unarmored vehicles. Let us consider now the capabilities of the armored division.

RELATIVE COMBAT POWER.—A comparison of the armament of the armored division with that of any other type of division in our army shows that the armored division is superior in firepower alone in the ratio of approximately five to one.

This comparison does not include the additional superiority in favor of the armored division which results from shock action, crushing ability, general mobility, maneuverability, and adverse effect on hostile morale. These characteristics cannot be accurately evaluated but it is conservatively estimated that they are at least of as great importance as the protected firepower of the division and will greatly enhance the combat power of the armored division.

The tactical result of the above capabilities is that the employment of armored divisions in combat permit the concentration of overwhelming force at decisive points and thereafter at other decisive points at the will of the commander.

You will note that the armored division has roughly five times the firepower of any other type of division, not to mention the combat power resulting from armor, mobility and the morale factor. This is the answer, gentlemen, to the questions with which I opened my conference. It is the *overwhelming combat* power that can be brought *quickly* to a vital point by the concentration of armored forces, aviation and motorized troops.

Napoleon said that "God was on the side that had the biggest battalions." He also stated that "the Spiritual is to the physical as three is to one." Forrest made the remark that "The side that wins is the one that gets there first with the most men." Brought up to date these ideas might be expressed—"Success in battle results from the concentration of overwhelming forces at decisive points to break through the full depth of the hostile main battle position and the subsequent exploitation by forces whose mobility permits them to concentrate overwhelming combat power at successive decisive points in the hostile rear areas."

This is blitzkrieg! It is founded on the principle of mass which is as old as warfare! The ability to fight this way results from having "the biggest battalions."

The characteristics of tank forces make them ideal for blitzkrieg purposes and it is my personal opinion that these characteristics, like those of the navy and of the air force, make it imperative to oppose hostile tanks with larger tank forces to insure a reasonable expectancy of success. Incidently, Germany probably has now over 400 tank battalions with somewhere around 30,000 tanks. Some of these are organized into 20 or more armored divisions completely equipped, with more in the making. The others not so organized appear to be GHQ reserve tanks.

HOW THE DIVISION OPERATES ON THE MARCH.—Having discussed the organization, the capabilities and limitations and the enormous combat power of the armored division let us look at the technique of command and control and the methods of operation which will develop the maximum combat power in that organization.

First, and of primary importance, comes the subject of combat intelligence. You have been given conferences on this subject so I will only discuss reconnaissance in the armored division. The reconnaissance battalion operates up to 150 miles ahead of the division. In order for it to have time to perform its main mission of determining and reporting on the strength, composition, location and movement of hostile main bodies it should be at least 50 miles ahead, or as far ahead as practicable. We saw where the battalion has the means to fight to gain information, but it avoids fighting when possible. The division commander can take care of small bodies of hostile troops by means of security detachments, or special counter-reconnaissance detachments. What he wants to know is, "What have I got to lick; is the intervening terrain and that on which I will fight suitable for the operation of my division; will the bridges hold the loads of this division, and so on." As the Cavalry Field Manual puts it, "The purpose of reconnaissance is to gain information upon which to base tactical operations or strategical maneuvers."

The reconnaissance aviation with the division works with the ground reconnaissance. Each supplements the other. At times the planes may be grounded by bad weather; at other times the reconnaissance battalion may be stopped by a barrier or by enemy forces. In either case, the other carries on so the commander is not entirely blind.

Information obtained is sent to the division command post and the necessary means are used to insure prompt delivery. Thus we may have an important message sent by radio, wire and officer motorcycle messenger or, if through a fire-swept area, by a tank.

Back of the division reconnaissance battalion the regimental reconnaissance companies precede their respective regiments by about 20 or 30 miles. Their mission is close reconnaissance. Now these distances may seem very large but distance is not measured in miles—IT IS MEASURED IN TIME; 150 miles at 25 mph is only 6 hours; 30 miles at 25 mph is 1 hour 12 minutes.

Next we have the advance guards. These, of course, are security detachments and their mission is to protect the main body against surprise and observation, to clear the way by driving back weak enemy forces, remove obstacles, and repair demolitions, and to secure for the main body the time and space required for its deployment for action in accordance with the plan of the commander. They will usually be from 5 to 15 minutes in advance.

Back of the advance guard, in the space between it and the head of one of the columns, the forward echelon of the division command post marches. The "old man" himself may be with it or he may be where he thinks his presence is needed. The brigade command post may be with it or similarly located in another column.

Next come the columns. In each column the different organizations are arranged from front to rear in the order of their probable entry into combat.

Forward echelon trains, containing supplies of immediate use, such as ammunition and gasoline, are normally with their organizations and rear echelon trains are usually at the rear of one or more of the columns.

Flank and rear security detachments are thrown out as the situation warrants.

Engineer reconnaissance detachments march with other organizations to insure timely report on bridges, obstacles, defiles and so on. Engineer organizations march with special detachments, with the advance guard, or well forward in the columns to minimize delay from obstacles.

Ordnance, quartermaster and medical detachments are allotted to columns for the necessary maintenance and evacuation.

The signal company insures good communications.

The lateral distance between columns will vary with the road net and the number of columns up to 20 or 30 miles, or about 1 hour.

Columns are usually equalized in length to shorten road space and facilitate entry into action and in many cases the number of columns will be governed by the road net, terrain and the situation.

In any case, considerable distance latterly between columns is advantageous as it provides depth to the command for deployment and maneuver in case action to a flank is necessary.

With the wide dispersion in distance you will see that command and control of the division requires all available means. The radio is the foundation of the control system as it is fast, has ample range and the radio is available in sufficient numbers. However, the radio has its limitations and, depending on conditions, it is often better to use messengers, both ground and air, visual signals and other means of communication.

In movement the position of the various columns or elements of the division are controlled by zones of action and phase lines, or points to reach at specified times, which are usually about one hour apart. Upon reaching a control point each column or element automatically reports in. If the column is delayed, report is made of that fact. In this way the division commander knows the disposition of his command within reasonable limits, at any time. The G-3 ordinarily rides with the division commander and keeps a G-3 operations map posted. My personal opinion is that the G-2 should also ride with the division commander and plot information of the enemy on the *same map* so that he can see at a glance the relative positions of the opposing forces and can issue instructions to subordinate commanders to secure an early advantage.

The size, power, mobility and rapidity of action of the armored division demand simplicity and mobility in the execution of command. Similarly, the speed of the various units requires flexibility in command to take full advantage of that speed. As one German colonel expressed it, "Surprise is important, but speed is more important." This is putting the cart before the horse because the use of speed in operations is one way of gaining surprise. Nevertheless, the remark is in keeping with the doctrines of modern war. It follows naturally that mobility, simplicity and flexibility in communications are also very important. Lacking these, the division may have to wait for orders, thus losing surprise, the value of mobility and the retention of the initiative. Fixed or elaborate command facilities will undoubtedly result in delay thus largely nullifying the powerful characteristics of the armored division, i.e., speed and mobility. Let me give you an example of the practical application of these principles.

It is well known that General Guderian, the German leader of the left mechanized column in the recent invasion of France, organized his headquarters into two sections. His staff, including his chief of staff, normally was in one of these sections. General Guderian, his aide and two or three radio operators in a special command vehicle constituted the other section. Usually the former remained under cover well to the rear while the general was right up front where he could have personal contact with his assault echelons and keep in touch with the situation better than he could from a position in rear. Although he was physically out of touch with the rear section he was in constant radio communication with it. The command of General Guderian was the one which, among other things, was the first to reach the Swiss border after a series of rapid advances which locked the door and blocked the escape of the Maginot Line defenders. Several times an advance of over 60 miles a day was made. This is a clear illustration of the technique of command and control of a large armored force. The system was simple, flexible and mobile. The great success of General Guderian's tank troops would indicate that his system of command was efficient. On the other hand, my personal opinion is that the entire command post should have been as far forward as practicable for better and more rapid control, communications and the collecting and dissemination of information. It was a one-man control system. It worked against a disorganized enemy. Would it work against a tough opponent? What would have happened if Guderian's car had been knocked out by a bomb?

As a general rule, all command posts should be as far forward as the situation permits at all times. They should keep up with the developments of the situation and with all orders issued by their particular commander. Each should know where the others are in order to facilitate communication and teamwork. They move by bounds and by use of messengers and the radio keep up with the situation even when in movement. Necessarily they have to be as mobile as the troops to which they pertain; if not more mobile.

HOW THE DIVISION FIGHTS.—So much for a brief resumé of how the division operates on the march. I will now take up the general methods of combat.

First, I will give several general ideas so that you will not wonder why the armored division, which has great combat power, is normally not used against the strongest portion of the hostile main battle position.

A modern war, where *two opposing armies are in actual physical contact*, is decided within a few weeks instead of a few years as heretofore. War is no longer a matter of attrition. The power to break through a hostile position can now be concentrated rapidly and secretly and the attack can be launched before the enemy can overcome battlefield inertia and can redispose his forces to meet it. What then is the hostile counterstroke? It is the counterattack and if this counterattack can be broken up, before it is organized and coordinated, exactly as was done in France, the enemy can be defeated in detail. Consequently, the attacking army launches its attack with overwhelming force at a vital point, using a great preponderance of infantry, artillery, GHQ reserve tank battalions, combat aviation and possibly horse cavalry. The mission of this force is to break through the full extent in depth of the enemy battle position. This action is rapid to prevent the hostile force from using delaying tactics to gain time to move the reserves. The tank battalions, generally from the GHQ reserve and not a part of the armored divisions, are employed in this breakthrough. As soon as practicable, the armored divisions, reinforced by motorized troops and combat aviation, strike through the gap and disorganize rear installations, defeat or delay hostile reserves and prevent the enemy from launching a coordinated counterattack. This type of action produces decisive results, whereas a breakthrough without deep exploitation produces only a local victory with but little consequences to the enemy.

This is the system that the Germans have used in their entire diplomatic and military activities. By diplomatic pressure other states have been held off while one or several were defeated by the concentration of power and exploitation in these states. On the field of battle direct pressure was applied along the entire front and concentration of power made at selected points with a penetration and exploitation at each point. Defeat in detail is the German fetish. It has produced remarkable results.

Let us consider several cases. In the first case, suppose the armored division or any part of it is used to assist in making the breakthrough. What happens? The division suffers casualties, becomes disorganized, needs resupply and reorganization. Time is needed to repair the damage—*time that is of great value to the enemy.* In the battle around Sedan a French counterattack was delayed thirty minutes. In the meantime, the Germans extended their bridgehead three miles to the south, three miles to the west, and three miles to the north.

Secondly, suppose the resistence is not serious to the armored division. In this case, the armored division can drive through and save the *time* that would otherwise be used in making a breakthrough for it.

In the third case, suppose a particular location is difficult for tanks, either from poor terrain, obstacles, or fire, or all. In this case a careful estimate would be made to determine if there were not another area which would offer more speed, hence less time, in getting into hostile rear areas in condition to perform its main mission of nullifying hostile counterstrokes.

Of course, emergencies always arise on the battlefield and in case of an emergency the gravity will dicate the employment of the division, based on the probable results to be obtained.

In general then we can say that the armored division will do most of its fighting in hostile rear areas in meeting engagements, and that its main adversaries will be infantry divisions, either motorized or foot, and hostile armored forces. Undoubtedly the immediate objective will be the hostile armored forces if any are present.

In all cases and at all times, antiaircraft and antimechanized defense of the division is essential. Main reliance is placed on an efficient warning system which consists of the reconnaissance elements, security detachments and other necessary sentries or scouts. In case of attack from the air the division fights back while continuing on its mission. If attacked by other armored forces it will usually have to defeat them before it can continue on its mission.

In considering the use of supporting combat aviation it must be understood that the most effective support will be given by bombardment planes which come close to the ground to drop their bombs. Bombing from 20,000 feet may be about as accurate and effective but planes at that elevation cannot see small indistinct targets such as an antitank gun and, hence, their support would not be as effective as that of the low flying bomber. Control of the air is very necessary to the success of tank organizations so all plans for tank operations must include this provision.

At times the use of air-borne troops with the armored division is necessary. For example, tanks, being particularly sensitive to terrain, need roads and bridges for rapid operation. Often the destruction of a bridge will hold up the advance of a column for a considerable time. If the bridge can be seized by air-borne troops and held pending the arrival of the division, the advantages resulting are obvious.

We will consider now the most likely use of the division against hostile armored forces which, organization for organization, has about equal combat power or is not too strong to defeat. In this case, other things being reasonably equal, the commander who seizes the initiative and attacks first with vigor and determination, has the greatest chance of success.

The usual method of attack is to put down a pivot of maneuver strong enough to stop the enemy and make him deploy. At the same time a strong maneuvering force is sent rapidly by concealed routes to attack the enemy in flank and rear. The rapidity with which this maneuvering force can strike the enemy determines to a large extent the degree of surprise that can be obtained. In addition, if the enemy can be caught in the act of deploying he is particularly vulnerable. Against equal or superior tank forces a large reserve, up to one-fourth of the entire command, is held out, so located as to be able to reinforce the main effort of either the maneuvering force or of the secondary attack, and to take advantage of any fleeting opportunity.

All available fire power both ground and air, is used to support the attack.

This same principle is carried out down to and including the platoon or other groups. Thus a platoon acting alone, or a group of motorcycle scouts, would put down frontal fire and under cover of this using natural covered routes, would strike the enemy in flank and rear while up to one-fourth of the group would be held in reserve.

In fighting troops of less mobility as motorized infantry and foot infantry, the armored division attacks in the same manner. In these cases the armored infantry is generally used for the pivot and the reserve may be smaller.

Full advantage of superior mobility should be taken to get surprise. In all cases, maximum use is made of the terrain.

If the enemy is greatly superior, which may well be the case, the division, by rapid maneuver and skillful use of the terrain and natural obstacles, attempts to defeat him in detail.

You will note that the holding echelon is generally used for the pivot of maneuver, particularly in fighting unarmored forces. Also, you will note that it will be of great value to use in the attack to clear up an obscure situation and to perform security missions at night.

CONCLUSION.—In conclusion I would like to bring out the following important ideas:

a. Recent events have proved that there is no rule that will hold in modern war. Each problem must be solved as a separate one.

b. To be a good G-1, G-2 or G-4, you first have to be a good G-3, because staff operation in practically every case will be based on tactical requirements—not on staff requirements.

c. The technique of war is constantly changing. A staff officer's value to his organization will be largely determined by his knowledge of new methods and new systems. This requires study, thought and application.

d. The new use of planes and tanks in large masses with great vigor has a profound effect on the tactics and technique of all branches and services. It is certain that wars will be those of maneuver rather than those of position until some efficient means are devised to stop tanks. The most effective means at the present time are superior armored forces.

e. The above remarks are only an outline but should have left the impression that modern war calls for commanders and staff officers with "streamlined" brains as well as it calls for "streamlined" divisions.

The Armored Division in Exploitation and Pursuit

BY
LIEUTENANT COLONEL V. W. B. WALES, *Cavalry*

PROBLEM

Strategic Map 1/500,000—Situation 29 October and Situation at 3:00 PM, 31 October.

1. SITUATION.—After considerable hard fighting Red and Blue forces are opposing each other along the general line: GETTYSBURG—LITTLESTOWN—BANDANNA—NEW FREEDOM—STEWARTSTOWN—SHARON—BELCAMP. (See Situation Map.) Blues have had considerable success and morale is high. Red morale is low.

The Commanding General of the Blue (north) force decides to attack without delay, rupture the hostile line be-

tween GETTYSBURG and LITTLESTOWN, and exploit and pursue through the breakthrough in order to annihilate the Red armies opposing him.

Extracts from his plan which he completed at 6:00 AM, 29 October are as follows:

To attack with armies abreast. First Army on the right.

Boundary between armies—the line: YORK—HANOVER JUNCTION—GLENVILLE—DUG HILL RIDGE—PARRS RIDGE (all to First Army). (See blue line on situation map.)

To order the Second Army to attack east of STEWARTSTOWN on 30 October to punish Red forces, create a diversion and draw Red reserves to the northeast of the line: PRETTYBOY RESERVOIR—LOCH RAVEN RESERVOIR. To have this army prepared to take advantage of any success obtained. To have it continue the attack on the 31st to prevent movement of Red main reserves to the west.

To order the First Army to attack on 31 October making its main effort between GETTYSBURG and LITTLESTOWN, rupture the hostile battle position and continue to attack and roll up the hostile flanks by the breakthrough. To reinforce it to the necessary extent with GHQ Reserve Tank Battalions and other forces.

To hold the 1st Armored Corps, consisting of the 1st and 2d Armored Divisions, in concealed positions in the vicinity of WEIGLESTOWN (5 miles west of YORK) (see situation map) prepared to exploit and pursue in the zone of action of either the First or Second Army depending on the outcome of the attacks by those armies. To attach the 11th Division (Square), motorized, and the 13th Division (Square), motorized, to the 1st Armored Corps for the operation. To have the Commanding General of the armored corps, reinforced, make plans for the employment of his command in the zone of action of each army—plan "A" for operation initially in the zone of action of the First Army and plan "B" for operation initially in the zone of action of the Second Army.

The GHQ Air Force to continue to maintain command of the air in the area east of SOUTH AND BLUE RIDGE MOUNTAINS (shown on west side of situation map) south of the SUSQUEHANNA RIVER to the south boundary of the STATE OF VIRGINIA. Commencing at daylight 30 October, 1940, to have it destroy all bridges over the POTOMAC RIVER east of HARPERS FERRY (inclusive) and delay the northward advance of large enemy columns south of the POTOMAC in the zone of action. Commencing at the time the Armored Corps, reinforced, moves to the attack, one wing of light bombardment aviation to be attached to the armored force for operation. The First Army to attach two squadrons of observation aviation to the armored corps, one squadron to be attached at daylight 31 October, and the other at 10:00 AM 31 October. After 12:00 noon, 30 October, first priority for transport planes to be for supply of the armored force, reinforced.

At daylight 30 October one parachute battalion to be held in readiness upon call from the armored corps, reinforced.

To have the Second Army prepared to attach 2 squadrons of observation aviation to the 1st Armored Corps in case it operates initially in the zone of action of Second Army.

To keep all preparations for the attack secret.

To retain control of the armored corps, reinforced.

To have all plans for supply and communication prepared at once.

2. EXTRACTS OF PLAN "A" OF THE ARMORED CORPS. (As of 2:00 PM, 29 October, 1940.)—*a. Mission.*—To drive through the gap in the hostile lines between GETTYSBURG and LITTLESTOWN at the earliest practicable moment on 31 October. To proceed and strike through PARRS RIDGE in the vicinity of TAYLORSVILLE and MOUNT AIRY, in order to preprevent the enemy from establishing a defensive line along the PARRS RIDGE—DUG HILL RIDGE position, and to intercept, attack, and contain retreating enemy columns until direct pressure forces can overtake the enemy and between the two annihilate them.

b. The armored corps with the 11th Division, motorized and the 13th Division motorized, attached, to drive rapidly through the gap created by the attack of the First Army at the earliest practicable moment. At least three roads to be used. To have a study made of the roads in the probable zone of action.

c. Formation: Column of divisions in the order: 1st Armored Division; 2d Armored Division; 11th Division, motorized; 13th Division, motorized.

d. Routes of March: To be designated later.

e. The reconnaissance battalion, 1st Armored Division, following closely in rear of the GHQ reserve tank battalions (which are to be used to assist in rupturing the Red main battle positions) to avoid hostile defensive installations and reconnoiter in the zone: north boundary, U. S. HIGHWAY 140 (northwest of Baltimore) south boundary U. S. HIGHWAY 240 (northwest of Washington); east of the MONOCACY RIVER. Timely information of the location and movements of hostile troops to be directed. Upon arrival at PARRS RIDGE to have it revert to control of the Commanding General, 1st Armored Division.

The reconnaissance battalion, 2d Armored Division, following in rear of the reconnaissance battalion, 1st Armored Division, to avoid hostile defensive installations, to proceed rapidly to the vicinity of GERMANTOWN and establish a line of observation along the POTOMAC RIVER east of HARPERS FERRY, inclusive. To have it responsible for reconnaissance in the area U. S. HIGHWAY 240—POTOMAC RIVER (both inclusive). Both reconnaissance battalions to report to 1st Armored Corps and to their divisions.

Negative information to be reported every hour and positive information when it is obtained.

To have them report on ground which can be used for landing fields.

The advance not to be delayed to offer combat.

Early information on the location of enemy defensive positions along PARRS RIDGE south of WESTMINSTER and on the condition of the bridge over the NORTH BRANCH of the PATAPSCO RIVER at ELLICOTT CITY to be ordered.

f. The 2d Engineer Battalion, armored, to follow in rear of the 2d Reconnaissance Battalion and be prepared to repair routes to assist the rapid advance of the armored corps. The Commanding Officer of the engineer battalion to coordinate with the commander of the engineers attached to the infantry making the main effort. The 2d Engineer

Battalion to rejoin the 2d Armored Division when the latter reaches TANEYTOWN.

g. The 12th Observation Squadron, commencing at daylight 31 October, 1941, to perform reconnaissance missions in the area south of the hostile battle position to the POTOMAC RIVER and east of SOUTH MOUNTAIN. Information on the condition of roads and bridges and on the strength, location and movements of hostile bodies of troops to be reported. Oblique photographs of probable enemy positions along PARRS RIDGE prior to 11:00 AM, 31 October to be obtained. When the attack by the armored corps is launched, the 12th and 13th Observation Squadrons to be attached for operations to the 1st and 2d Armored Divisions, respectively.

h. The 1st Wing (light bombardment), attached for operations by GHQ, effective at the time this corps initiates the march to the south, to furnish a liaison officer to these headquarters and to the headquarters of each division. The 1st Wing to support the attack of this corps by successive bombing concentrations on enemy forces delaying the advance. Continuous air support to be furnished each division by successive flights, leaving the airdrome at intervals of fifteen minutes after "H" hour. Calls for additional air support to come through these headquarters.

i. At daylight 31 October one parachute battalion to be held in readiness upon call from the Division Commander, 1st Armored Division.

j. The 1st Armored Division to attack and destroy any hostile forces encountered on the axis of advance south of the line: EMMITSBURG—WESTMINSTER.

3. SEQUENCE OF EVENTS.—The attack by the Second Army was launched as planned but Reds, by rushing up strong reserves and by moving reserves in from the west, managed to stop the attack along the line: NEW FREEDOM—SHARON—ABINGDON. Blues were unable to penetrate the line at any point.

On the morning of the 31st the general Blue attack was launched with the main effort being made between GETTYSBURG and LITTLESTOWN. The First Army using three tank groups (GHQ reserves) (approximately 800 tanks) on a front of 2,000 yards initially with a strong concentration of other arms and combat aviation had little difficulty in breaking through the Red main battle position to the full extent of its depth. Continued attacks to the flanks widened the breach. At the same time the Second Army made repeated attacks to deceive the enemy as to the location of the Blue main effort and to prevent Reds from moving any reserves to oppose the First Army.

4. SECOND SITUATION.—The passage through the gap by the 1st Armored Corps, reinforced, in the zone of action of the First Army was successful and at 3:00 PM, 31 October, 1940 the situation had developed into that shown on the situation map. The entire enemy line was giving way under repeated Blue attacks. At this time the Commanding General of the 1st Armored Corps, reinforced, decided to drive eastward with the 1st Armored Division, to use his combat aviation to delay the hostile mechanization debauching north from WASHINGTON and to march the 2d Armored Division rapidly to the south to attack it. To use the 11th and 13th motorized infantry divisions initially to secure PARRS RIDGE between TAYLORSVILLE and MOUNT AIRY.

He immediately issued the appropriate orders by radio and orally to carry out his decision.

Major General A, commanding the 1st Armored Division, in compliance with his orders decided to:

a. Move rapidly through PARRS RIDGE generally between MOUNT AIRY and TAYLORSVILLE, attack and destroy enemy columns approaching from the east with a view to proceeding north of BALTIMORE to prevent escape of retreating enemy forces.

b. To direct his reconnaissance battalion to establish and maintain contact with retreating enemy columns.

c. To direct the 12th Observation Squadron to perform its normal missions paying particular attention to the crossings of the PATAPSCO RIVER from RELAY (about seven miles southwest of the center of BALTIMORE) to the northwest. Particular attention also to be paid to the composition, disposition and movements of hostile retreating columns.

At this time he was at the head of the center column of his division with the forward echelon of his staff, his brigade commander and separate organization commanders halted temporarily at WINFIELD (where the point of the advance guard of the center column is shown on map). All present had been informed of the situation. The right column consisted of the medium tank regiment, the field artillery battalion, armored, the bridge company and another company of engineers. The center column consisted of the 1st Light Tank Regiment, two batteries of the field artillery regiment, armored, a battalion of the infantry regiment, armored, and a company of engineers, armored. The left column consisted of the 2d Light Tank Regiment, the field artillery regiment, less two batteries, the infantry regiment, armored, less a battalion and a company of engineers, armored. Other elements of the division were disposed so as to equalize the length of columns—each being about one hour long—and so that the heavier vehicles marched on the road leading in the most direct route to U. S. Highway 40 (west of Baltimore). Preliminary air reconnaissance, confirmed by the reconnaissance battalion 1st Armored Division, had established the fact that the three routes chosen (see situation map) offered the best chance for a minimum of delay and that the road on the right (west) would take the heaviest loads of the division with a minimum of engineer work.

Requirement.—The orders as actually issued by Major General A at about 3:15 PM, 31 October to carry out his decision.

A SOLUTION

At about 3:15 PM, 31 October, Major General A at the head of his center column at WINFIELD issued the following oral order to his staff, brigade commander and separate organization commanders.

"Gentlemen you know the situation.

"This division attacks at once, defeats the hostile columns in our front, disperses them and drives toward the north of BALTIMORE to intercept and attack the enemy columns in retreat from the north.

"The two left (east) columns (less one battalion of light tanks in division reserve) under command of the brigade

commander will attack the hostile triangular force directly in their front, disperse it, push rapidly to the east and secure the crossings over the PATAPSCO RIVER in the vicinity of STATE HIGHWAY 26, and operate against the heads of columns moving south on U. S. HIGHWAYS 1 and 111. The air field northwest of BALTIMORE will be seized.

The right (west) column (less one company of medium tanks, in division reserve, and the artillery battalion), Colonel X commanding, pushing rapidly to the east will clear U. S. HIGHWAY 40 and seize the crossing of the PATAPSCO RIVER at ELLICOTT CITY. It will be prepared to reinforce the action of the two left columns. The armored infantry regiment (with the battalion of armored artillery attached) will contain the hostile columns on U. S. HIGHWAY 40 and STATE HIGHWAY 26, until the position between MOUNT AIRY and TAYLORSVILLE is taken over by the leading elements of our motorized divisions, at which time it will join the division reserves.

"The reconnaissance battalion will establish contact at once with retreating enemy columns and will keep me informed of their strength, composition and movements.

"The 12th Observation Squadron will perform its normal missions, paying particular attention to reconnaissance of the crossings of the PATAPSCO RIVER from RELAY (about seven miles southwest of the center of BALTIMORE) to the northwest and also to the composition, disposition and movements of hostile retreating columns.

"Exploitation and pursuit will be carried to the limit of endurance.

"Rapid aggressive action is imperative.

"Main bodies of hostile columns will be prevented at all costs from establishing a defense in BALTIMORE.

"Administrative details later.

"I will follow the south column with the division reserve without distance and will protect the right flank of the division."

To G-3: "Request through Corps all combat aviation available to assist in attack of the Red blocking columns and to delay southward movement of hostile columns. Request that the parachute battalion be given the mission of seizing and holding the stream crossing at ELLICOTT CITY at once. See that the division is informed of these orders without delay.

"It is now 3:20 PM.

"Are there any questions?

"Move out."

DISCUSSION

The employment of armored forces is ordinarily at a vital point, and if the results to be expected warrant the employment of the armored divisions they will also warrant the employment of GHQ reserve tank battalions. For this reason the GHQ reserve tank battalions are used to assist in making the breakthrough, and the armored divisions are held in reserve until such time as they can pass through the gap created by the breakthrough, in order to defeat the hostile countermeasures. In this connection, some or all of the GHQ reserve tank battalions, after their breakthrough mission has been accomplished should be attached to the armored corps for further operations. In all probability the breakthrough could be made by the infantry-artillery team supported by aviation and by only a fraction of the GHQ tank forces actually employed, but time is a vital factor in this case, so a considerable number of tanks are used in the breakthrough to crush all opposition in the minimum of time.

It will be noted that the plans of attack are simple in all cases and that vigor and determination in their execution are of prime importance.

The attack of the Second Army is planned as the secondary attack and that by the First Army is planned as the main effort. The Second Army might be successful and consideration must be given to exploiting that success in case it becomes advisable. For this reason a plan is made in advance to cover this contingency. However, the terrain in rear of the Red lines in the zone of action of the Second Army is not so suitable for rapid exploitation and pursuit as that in the zone of action of the First Army. The stream lines and ridges run generally northwest and southeast and afford a succession of delaying positions that Reds could use in making an orderly retreat. The road net, although more extensive in the east sector, crosses these obstacles and troops moving on them would be subject to much delay. On the other hand the ridge line running through Lineboro, Westminster, Taylorsville, Mount Airy south to Germantown, and, in addition, Seneca Creek afford a strong defensive position that the Reds could occupy to protect the withdrawal of their right (east) wing. In the preplanning this is foreseen, and the possibility of Reds occupying it in force before Blue troops could seize part of it is taken care of by employing secrecy, rapidity of action and deception.

The armored corps is held in concealed positions near York ready to move so as to pass through the gap at the earliest practicable moment. Reds cannot know, until too late, just where and how it will be employed. This fact, coupled with battlefield inertia, will, in all probability, give Blues the opportunity to seize a part of the ridge line running through Taylorsville and Mount Airy before the Reds can block along that line.

The holding power of the armored divisions is temporary, therefore two motorized divisions are attached to the armored corps. In rapid movement the artillery will be unable to furnish much fire support so one wing of light bombardment aviation is attached for operation. Observation aviation is attached in order to furnish each division with aerial observation and transport planes are held for supply of the armored division if it becomes necessary. One parachute battalion is held on call in the event that its employment to hold an important terrain feature may facilitate the rapid advance of the corps. Secrecy is maintained in order to secure the element of surprise for the Blue forces.

In making Plan A, the armored corps commander considers the fact that speed is essential. Through this speed a large measure of tactical surprise is obtained. As a result of careful reconnaissance and the study of all available information, three roads are selected to use in passing through the gap. These roads are not essential as the armored divisions can move across cross-country, but, by the use of roads, comparatively rapid movement results. One of these roads should be suitable with the minimum of engineer work for carrying loads up to 30 tons, the weight of the medium tank. The formation: column of divisions in the order—1st Arm-

orded Division, 2d Armored Division, 11th Division, motorized, 13th Division, motorized, is selected, so that the striking power of the corps, reinforced, will be at the head of the column and the holding power will be at the rear where it can take over from the armored divisions. It will be used to protect routes of communication and hold important terrain features, depending on how the enemy reacts to the attack by First Army. The routes of march cannot be announced finally until the gap has been created. Therefore, they will be announced just prior to the march through the gap.

The corps commander desires to know what large enemy reserves are in his line of march, or can reach his line of march before he gets in rear of the hostile east flank. He, therefore, pushes his divisional reconnaissance elements through the gap by infiltration to seek out and report on enemy forces that might defeat his purposes. In addition one of the main considerations of security is based on timely information of the enemy. As is usually the case, negative information is very important and he, therefore, plans to have it reported every hour. By knowing what the enemy is not doing it will help to give him a very good picture of what the enemy is doing.

He desires information of landing fields because they will be important, not only for operation of his observation aviation but because they may also be needed for supply.

Information on the condition of the bridge across the Patapsco River at Ellicott City appears of great importance in the plan for the exploitation and pursuit, and he, therefore, plans that this information be secured.

If the enemy holds the ridge positions running southwest of Westminster he desires to know the disposition of the Red troops in order to strike at the weak point or points with a view to driving through in order to cut off the retreat of enemy columns by operating north of Baltimore.

Engineers are of great importance in this operation to repair and strengthen bridges, repair road demolitions, construct by-passes, erect obstacles to delay the enemy and in every way facilitate the rapid advance of the armored corps.

Observation aviation is utilized as part of the air-ground reconnaissance team and is essential to obtain early information which cannot be obtained by other means.

Modern operations prove that the support of combat aviation is of great value to successful operation by armored forces. The corps commander, therefore, provides for some continuous support from the air and for the employment of the wing of light bombardment aviation in mass should the necessity arise.

The 1st Armored Division is given an aggressive mission so that delay to the remainder of the column will not ensue.

So much for a brief outline of the corps commander's reasoning. Now let us view the matter from the armored division's standpoint.

Having received his orders at about 3:05 PM 31 October, Major General A, commanding the 1st Armored Division, makes his decision in accordance with those orders. An intermediate objective is introduced into the picture as far as he is concerned, that is, the defeat of the hostile blocking columns moving toward him in his front. To avoid those columns and march around them would permit them to occupy the ridge and result in ultimate delay to the armored corps reinforced. In addition he is going to need the roads now occupied by those columns, particularly where the bridges cross the Patapsco River and streams to the east. In all probability there will be much less delay resulting from the attack of those columns than from avoiding them. He, therefore, directs the attack of the enemy, employing his two north columns to defeat the hostile triangular force and the south column to clear U. S. Highway 40, which will carry the heaviest loads of the division.

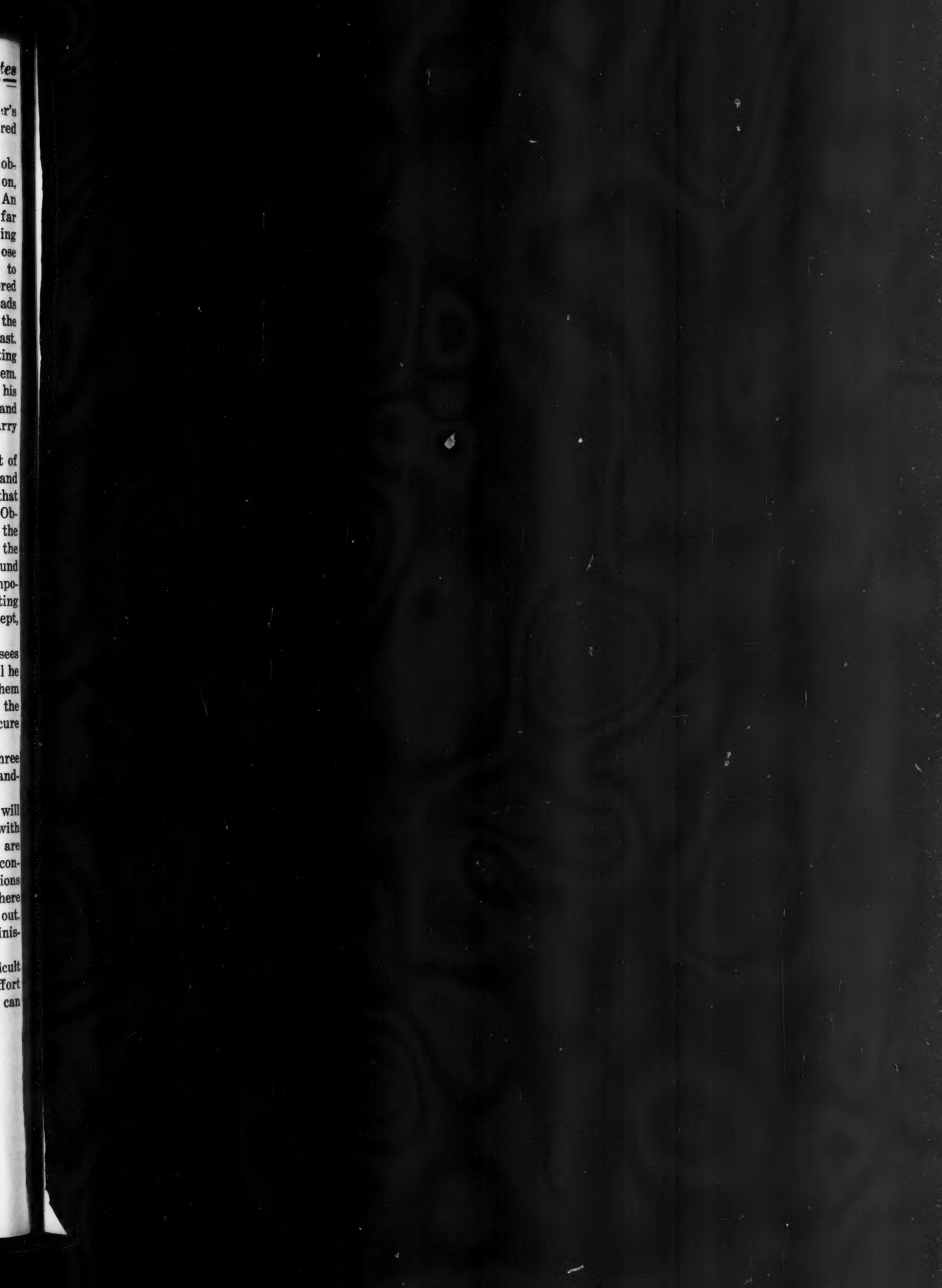
He directs his reconnaissance battalion to move out of the zone of action previously designated and establish and maintain contact with the retreating enemy columns so that he will know enemy movements. He directs the 12th Observation Squadron to reconnoiter the crossings of the Patapsco River because those are the points where the greatest delay to the division can be expected. Both ground and air reconnaissance are directed to report on the composition, disposition and movements of the hostile retreating columns in order that he can make early plans to intercept, attack and contain them.

At the time the order is issued, Major General A sees that he will probably not need his armored infantry until he reaches points north of Baltimore. He, therefore, uses them to contain the enemy blocking columns to insure that the attached infantry motorized divisions will be able to secure the ridge position without having to fight for it.

Engineers are already dispersed throughout the three columns and they will be employed by the column commanders as the necessity arises.

Some vehicles are running low on gasoline and will have to refill from forward echelon trains which are with their respective organizations. Column commanders are taking care of this on their own initiative. The main consideration at this time, however, is to reach attack positions north of Baltimore and it is impossible to foresee just where and when resupply and maintenance will be carried out. For this reason, Major General A directs that the administrative instructions will be issued later.

In conclusion, Major General A knows that difficult conditions exist in fighting in towns so he makes every effort to cut off the retreat of main enemy columns before they can enter Baltimore.



Library Bulletin

BOOKS ADDED TO THE LIBRARY SINCE MARCH 1941

Academy of Political Science. — **The defense of the United States.** (Proceedings of the Academy of Political Science, January 1941). 1941 [M 103-C.73-A]

Adamic, Louis. — **From many lands.** 1941 [325.73]

Aircraft Year Book for 1940. 1940 [M 603]

Allen, W.E.D. — **The Ukraine: A History.** 1941 [947.7]

American Geographical Society. — **The European possessions in the Caribbean Area.** A compilation of facts concerning their population, physical geography, resources, industries, trade, government and strategic importance. 1941 [972.9]

Arnold, Major General H.H. & Eaker, Colonel Ira C. — **Winged warfare.** 1941 [M 409-J1-A.73]

Aubry, Octave. — **The Second Empire.** (Translated by Arthur Livingston) 1940 [M 944-07]

Baldwin, Hanson W.:

United We Stand! Defense of the Western Hemisphere. 1941 [M 103-C.73]

What the citizen should know about the Navy. 1941 [M 8203-C.73-A]

Barber, Joseph. — **Hawaii: Restless rampart.** 1941 [996.90]

Bartlett, Captain Sir Basil. — **My first war.** An army officer's journal for May, 1940, through Belgium to Dunkirk. 1940 [M 9405-B4.42]

Bartlett, F.C. — **Political propaganda.** 1941 [M 008-K]

Bemelmans, Ludwig. — **The donkey inside.** 1941 [918.69]

Benns, F. Lee. — **Europe's return to war, 1938-1940.** A supplement to European history since 1870 and to the fourth edition of Europe Since 1914. 1940 [940.5]

Bernays, Edward L. — **Speak up for democracy.** What you can do. A practical plan of action for every American citizen. 1940 [321.4]

Bigland, Eileen. — **Into China.** 1941 [951-A]

Brogan, D.W. — **France under the Republic.** The development of modern France (1870-1939). 1940 [944-A]

Caldwell, Taylor. — **The earth is the Lord's.** A tale of the rise of Genghis Khan. 1941 [M 9517-B92 (GE)]

Cambridge Ancient History. Vol. X: The Augustan Empire, 44 B.C.—A.D. 70. 1934 [930-A]

Churchill, Winston S. — **Blood, sweat and tears.** 1941 [M 9405-E3-D.42]

Connecticut League of Women Voters. — **Freedom or fascism?** 1940 [321.4]

Court of Claims. — **Cases decided in the Court of Claims of the United States, April 1, 1940 to October 6, 1940.** Vol. XCL. 1940 [345.41]

Crockett, Lucy Herndon. — **Capitan.** The story of an army mule. 1940 [M 203-C.73-B7-F]

Day, A. Grove. — **Coronado's quest.** The discovery of the southwestern states. 1941 [917.80]

Dodd, William E. — **Ambassador Dodd's diary, 1933-1938.** Edited by William E. Dodd, Jr. and Martha Dodd. 1941 [973-B92 (DO)]

Downes, Randolph C. — **Council fires on the Upper Ohio.** A narrative of Indian affairs in the Upper Ohio Valley until 1795. 1940 [M 973-Q1-A.73]

Eastman, Max. — **Marxism: Is it science?** 1940 [335]

Eliot, Ellsworth. — **West Point in the Confederacy.** 1941 [M 209-C.73-D3C]

Farson, Negley. — **Behind God's back.** 1941 [916.0]

Federal Reporter, Second Series. Volumes 114, 115, 116. 1941 [345.41]

Federal Supplement. Cases argued and determined in the District Courts of the United States and the Court of Claims. Volumes 34 and 35. 1941 [345.41]

Fenneman, Nevin M. — **Physiography of eastern United States.** 1938 [551.4]

Footner, Hulbert. — **Sailor of fortune.** The life and adventures of Commodore Barney, U.S.N. 1941 [M 973-B92 (BA)]

Ford, Harvey S.—**What the citizen shold know about the army.** 1941 [M 203-C.73-A]

Galdames, Luis. — **A history of Chile.** (Translated and edited by Isaac Joslin Cox). 1941 [983]

Gordon, Manya. — **Workers before and after Lenin.** 1941 [947.09]

Hallgren, Mauritz. — **Landscape of freedom.** The story of American liberty and bigotry in America. 1940 [973-A]

Hartz, Louis. — **Civil-military relations.** Biographical notes on administrative problems of civilian mobilization. 1940 [M 106-A]

Hitti, Philip K. — **History of the Arabs.** 1941 [953]

Houston, Sam. — **The writings of Sam Houston, 1821-1847.** Vol. IV: September 29, 1821 — February 28, 1847. Edited by Amelia W. Williams and Eugene C. Barker. 1941 [M 973-B92 (HO)]

Hunt, George T. — **The wars of the Iroquois.** A study in intertribal trade relations. 1940 [M 973-Q1A]

Illinois State Historical Society. — **Journal of the Illinois State Historical Society.** Vol. 32: March–December 1939. 1939 [977.3]

International Congress of Military Medicine and Pharmacy. — **Tenth International Congress of Military Medicine and Pharmacy, 1939, May 7 to 15.** 1939 [M 612-D1.73]

Jack, D.T. — **Studies in economic warfare.** 1941 [M 008-A]

Kenderdine, Major John D. — **Your year in the army.** What every new soldier should know. 1940 [M 209-C.73-C]

Kidd, Lieutenant W.R. — **Police interrogation.** 1940 [352.273]

Knollenberg, Bernhard. — **Washington and the Revolution: A reappraisal.** Gates, Conway, and the Continental Congress. 1940 [M 973-B92 (WA)]

Kraus, René. — **Winston Churchill, a biography.** 1940 [M 942-B92 (CH)]

Langer, William L. — **An encyclopaedia of world history.** Ancient, medieval and modern, chronologically arranged. A revised and modernized version of Ploetz's "Epitome." 1940 [902]

Langsam, Walter Consuelo. — **Since 1939.** A narrative of war. Supplement to "The World Since 1914." 1941 [M 9405-E3-C.73]

Langsburgh, Richard H. and Spriegel, William R. — **Industrial management.** 1940 [658]

Laski, Harold J. — **Where do we go from here?** 1940 [M 9405-C6-A.73]

League of Nations. — **Armaments Yearbook, 1939-40.** 1940 [M 104-A6]

Leff, David N. — **Uncle Sam's Pacific Islets.** 1940 [990.0]

Lester, Bernard. — **Applied economics for engineers.** 1939 [658]

Liddell Hart. — **Dynamic defense.** 1940 [M 9405-E4-D.42]

Maginot, Marguerite Joseph. — **He might have saved France.** The biography of André Maginot. (Translated by Allan Updegraff). 1941 [M 944-B92 (MA)]

McWhorter, Lucullus Virgil. — **Yellow Wolf: His own story.** 1941 [M 973-Q1-B92 (YE)]

Mendershausen, Horst. — **The economics of war.** 1940 [M 008-A]

Miller, Emanuel. — **The neuroses in war.** 1941 [M 501-G1.73]

Moën, Lars. — **Under the iron heel.** 1941 [M 9405-B4.73]

Monks, Noel. — **Squadrons up!** A firsthand story of the R.A.F. 1941 [M 9405-G9-B4.42]

Montague, Ludwell Lee. — **Haiti and the United States, 1714-1938.** 1940 [327.73 (.7294)]

Morgan, J. McDowell. — **Military medals and insignia of the United States.** 1941 [M 104-B3]

Owen, Russell. — **The Antartic Ocean.** 1941 [919.99]

Palmer, Brig. General John McAuley. — **America in arms.** The experience of the United States with military organization. 1941 [M 103-C.73]

Parkes, Henry Bamford. — **Recent America.** A history of the United States since 1900. 1941 [973.9]

Peattie, Roderick. — **Geography in human destiny.** 1940 [910.1]

Pilsudska, Madame. — **Pilsudski.** A biography by his wife, Alexandra Pilsudska. 1940 [M 9438-B92 (PI)]

Political Handbook of the World. Parliaments, parties and press as of January 1, 1941. 1941 [354]

Polo Association. — **Yearbook of the United States Polo Association, 1941.** 1941 [M 403-G7.73]

Portway, Donald. — **Science and mechanisation in land warfare.** 1939 [M 501-A.42]

Powell, Hickman. — **What the citizen should know about the Coast Guard.** 1941 [M 8309-C.73]

Pratt, Fletcher. — **America and total war.** 1941 [M 103-C.73]

Rauschning, Hermann. — **The redemption of democracy.** The coming Atlantic Empire. 1941 [M 9405-C5-A]

Reddaway, W.F. — **Problems of the Baltic.** 1941 [949.6]

Reynolds, Quentin. — **The wounded don't cry.** 1941 [M 9405-B4.73]

Richmond, Admiral Sir Herbert. — **British strategy: Military and economic.** A historical review and its contemporary lessons. 1941 [M 501-D.42]

Robbins, Lionel. — **The economic causes of war.** 1941 [M 003-D]

Romains, Jules. — **Aftermath.** 1941 [943.91]

Rowan, Richard Wilmer. — **Terror in our time.** The Secret Service of surprise attack. 1941 [M 505-E4]

Schlamm, William S. — **This second war of independence.** A call to action. 1940 [M 9405-E3-C.73]

Schuman, Frederick L. — **Night over Europe.** The diplomacy of Nemesis 1939-1940. 1941 [M 9405-C6-C.73]

Seton, Anya. — **My Theodosia.** 1941 [813]

Sixth Division. — **History of 6th Infantry Division, United States Army.** 1941 [M 9403-H6-C.73-G3-C6C]

Snow, Edgar. — **The battle for Asia.** 1941 [M 951-A]

Spaight, J.M. — **The sky's the limit.** A study of British air power. 1940 [M 409-J1-A.42]

Stalin, Joseph. — **Stalin's Kampf.** Joseph Stalin's credo written by himself. 1940 [M 947-B92 (ST)]

Strategicus. — **The war for world power.** 1940 [M 9405-E3-D.42]

Strausz-Hupé, Robert. — **Axis America.** Hitler plans our future. 1941 [973.917]

Streeter, Floyd Benjamin. — **The Kaw: The heart of a nation.** (Rivers of America Series, edited by Stephen Vincent Benét and Carl Carmer.) 1941 [978.1]

Strode, Hudson. — **Finland forever.** 1941 [947.1]

"T.124." — **Sea power.** 1940 [M 8501-H.42]

Tchernavin, Vladimir V. — **I speak for the silent: prisoners of the Soviets.** (Translation from the Russian by Nicholas M. Oushakoff). 1935 [947-B92 (TC)]

Thomason, Lieut. Colonel John W. — **Lone Star Preacher.** Being a chronicle of the acts of Praxiteles Swan, M.E. Church South, sometime captain, Fifth Texas Regiment, Confederate States Provisional Army. 1941 [M 9737-B3-F.75]

Tierney, Luke and Parsons, William B. — **Pike's Peak gold rush guidebooks of 1859.** (Southwest Historical Series, Vol. IX, edited by LeRoy R. Hafen). 1941 [M 973-C]

United States Code Annotated. Title 16: Conservation: Title 28: Judicial code and Judiciary, Para. 721 to 723. 1941 [345.21]

United States Reports. Volumes 308 and 309. 1940 [345.4]

Valtin, Jan. — **Out of the night.** 1941 [947-B92 (VA)]

Van Kleffens, Eelco Nicolaas. — **Juggernaut over Holland.** The Dutch Foreign Minister's personal story of the invasion of the Netherlands. 1941 [M 9405-J.44]

Villard, Henry. — **Lincoln on the eve of '61.** A journalist's story. 1941 [973-B92 (LI)]

Wayland, John W. — **Stonewall Jackson's way.** Route — Method — Achievement. 1940 [M 9737-E4-C.75-B92 (JA)]

Werner, Max. — **Battle for the world.** The strategy and diplomacy of the Second World War. (Translated by Heinz and Ruth Norden). 1941 [M 9405-H1-D.73]

Wertenbaker, Charles. — **A new doctrine for the Americas.** 1941 [327.73 (.80)]

White, Steward Edward. — **The unobstructed universe.** 1941 [218]

Who's Who, 1941. An annual biographical dictionary with which is incorporated "men and women of the time." 1941 [942-B920]

Who's Who in Japan, 1940-41. With Manchoukuo and China. 1941 [952-B920]

Wiener, Frederick Bernays. — **A practical manual of martial law.** 1940 [M 207-C.73-J]

Williams, Douglas. — **The new contemptibles.** 1940 [M 9405-B4.42]

Williams, Rebecca Yancey. — **The Vanishing Virginian.** 1940 [973-B92 (YA)]

Wintringham, Tom. — **Armies of freemen.** 1940 [M 106-A6]

Wissler, Clarke. — **Indians of the United States.** Four centuries of their history and culture. 1940 [970.1]

World over in 1940. 1941 [909]

BOOK REVIEWS

THE EUROPEAN POSSESSIONS IN THE CARIBBEAN AREA

By the American Geographical Society

112 pages . . . New York: American Geographical Society

Reviewed by LIEUTENANT J. J. GLEASON, *Infantry*

Today when American attention, stimulated in the past by the exchange of destroyers for new bases, remains focussed upon the defenses of our southeastern seaboard, the Gulf coast and the Panama Canal, a desire naturally arises for information regarding European holdings in that general area. One is interested in knowing something about the European links that exist in the long, sweeping island chain which fronts the Caribbean.

The European Possessions in the Caribbean Area is a new booklet, covering the subject concisely and well. It is a full compilation of facts concerning the population, physical geography, resources, industries, trade, government and strategic importance of the British, French and Dutch colonies in that particular part of the world. There is, in addition, a survey of the island territories of Colombia and Venezuela.

Neatly indexed and organized with care, this booklet will be a quick, accurate work of reference for all who are interested in the question of safe-guarding "America's Mediterranean."

WINGED WARFARE

BY MAJOR GENERAL H. H. ARNOLD, CHIEF OF THE AIR CORPS
AND
COLONEL IRA C. EAKER, AIR CORPS

265 pages . . . New York: Harper & Brothers

Reviewed by Captain Ray W. Clifton, Air Corps

When a topic of high current military interest receives competent literary treatment at the hands of authors who know that topic inside and out, the result is sure to amount very nearly to a landmark achievement. In *Winged Warfare* one finds a most felicitous meeting of the subject, the men and the hour.

General Arnold and Colonel Eaker have prepared a comprehensive and attractively written survey of airplanes and the men who fly them. Discussed in order are the various phases of military aviation, starting with a description of the different types of aircraft and ending with an analysis of America's current program of air expansion. Many popular misconceptions with regard to the military airplane are dispelled, and a serious attempt is made to consider aerial warfare in its entirety, neglecting no fundamental aspect of the subject.

Of particular interest will be the chapters on "Air Tactics" and the "Strategy of Air Force Operations." The authors give a timely explanation, moreover, of the difficulties which arise in connection with large-scale aircraft production.

Winged Warfare is fortunate in its profuse supply of well-chosen photographic illustrations. They tend to heighten the effect of a very valuable and pleasing book.

DYNAMIC DEFENCE

BY CAPTAIN B. H. LIDDELL HART

55 pages . . . London: Faber & Faber

Reviewed by Colonel F. M. Barrows, Field Artillery

In this little book Liddell Hart gives a short sketch of the War, with lessons drawn, criticizes quite freely the high command, especially that of some years ago when armored forces were frowned upon and the high command declared in 1933 that "the Army was not likely to be used for a big war in Europe for many years to come."

While a great deal of the contents is controversial, most everyone will agree in his contention for a highly mobile and hard-hitting army with young and vigorous commanders.

Liddell Hart seems to have the idea that the mass infantry attack is to be no more, that this mass is a drain upon the nation, that fast tanks are a new style cavalry and not a mere support of infantry. Superiority in numbers means nothing in the new strategy. His most ingenious metaphor is when he says it was not by wielding a battering ram that the enemy forced his way into so many citadels, but by the use of the skeleton keys, the method of "indirect approach" and evasion, constantly seeking to strike at the rear, of which the breakthrough on the Maas was the crowning example.

Liddell Hart states that there were no new methods, merely a development of ideas of the younger minds of the British army after World War I but not given any attention at home by the higher command.

Much of his book has the implication of "I told you so," which never is pleasant to the reader, though quite satisfying to the author. In this connection are some 40 paragraphs in the back of the book in which the author shows his foresight over the period from 1919 to and including 1940 in which his principal theme is his endeavor to make Great Britain tank minded. The quotation of one paragraph will give an idea of his efforts. Here is the quotation: "That 'active military operations in the future. . . will be carried out almost exclusively by fleets of tanks and aircraft' while the achievement of a decisive blow would be dependent on 'one side being definitely superior in the air' either in numbers or quality. (March 1923, et seq.)"

The book is well worth reading and can be finished in an evening even by a slow reader, only 56 pages.

THE WAR FOR WORLD POWER

By Strategicus

304 pages . . . London: Faber and Faber, Limited

Reviewed by Colonel Kinzie B. Edmunds, Cavalry

A short account of the current war in Europe, the political events leading up to it and influencing its conduct, with descriptions of campaigns to include the evacuation of Dunkirk.

The writer is a British partisan and apologist. His book does not convey an impression either of profound knowledge on the part of its author of what he is talking about or of careful research. For example, he speaks of "the French military writer, General Douhet." Douhet was an Italian.

The book is not believed to be of any great value to a soldier who has followed closely the course of events in Europe. It might be of some use to one ignorant of these events who wished quickly to gain a general knowledge of them.

AMBASSADOR DODD'S DIARY—1933-1938

Edited by William E. Dodd, Jr. and Martha Dodd

464 pages . . . New York: Harcourt, Brace & Company

Reviewed by Lieutenant J. J. Gleason, Infantry

To represent the United States of America as ambassador to Berlin was sent in 1933 an eminent scholar, liberal thinker, and honest, unaffected gentleman. The hope was that Mr. Dodd, a Ph.D. from the University of Leipzig, thoroughly versed in German history and genuinely appreciative of Germany's great cultural tradition, would be able, by reason of his sincerity, attainments, and goodwill, to maintain German-American relations on a friendly, harmonious basis. *Ambassador Dodd's Diary* is the story of what happened during those ensuing five years.

No one who aspires to a grasp of current international affairs can let this book go unread. As Professor Beard observes in his introduction: "This is not to say that Mr. Dodd's accuracy is to be unchallenged in every detail, or that the stress of instant decision never warped his judgment. Such infallibility is granted to no mortal. But the training and experience in historical study and writing which Mr. Dodd brought to bear upon his journal are clearly revealed in it and distinguish it from whole libraries of diplomatic memoirs compiled by professional gossips. They give the diary a quality which makes it peculiarly significant for an understanding of our own times."

JUGGERNAUT OVER HOLLAND

By Eelco Nicolaas van Kleffens

195 pages . . . New York: Columbia University Press

Reviewed by Colonel Kinzie B. Edmunds, Cavalry

An account by the Dutch Foreign Minister of the German conquest of Holland, with a description of the events leading up to the invasion.

Naturally, the Dutch side is favored, but the book gives the impression of being an honest story, written by an honest man. Military operations are not discussed in sufficient detail to add anything to what we have already learned from other sources.

The picture of Holland's sincere—even rigidly impartial—efforts to keep the peace, and of the dramatic tenseness which preceded the breaking of the storm, is well presented by the man who was in a position to observe and record such matters.

UNDER THE IRON HEEL

By Lars Moën

350 pages . . . Philadelphia—New York: J. B. Lippincott Co.

Reviewed by Lieutenant J. J. Gleason, Infantry

The author is an American, formerly a newspaperman, who was doing scientific research in Belgium and lived in Antwerp under the German occupation from the time the city was seized until October of 1940. By reason of his familiarity with Belgian life and language and his established position in Antwerp when the invasion came, the German soldiery whom he met took for granted that he was a Belgian citizen. Thus he received a better and more typical view of the military occupation than he could ever otherwise have had. *Under the Iron Heel* is, therefore, a resident's picture of Belgian life under the rule of the Nazi army.

Mr. Moën discusses in detail the immediate reactions of the population to the German invasion, the effect of British night bombing, the food situation, the character and opinions of Nazi military personnel with whom he came in contact. The book is essentially non-military in nature, yet it will have a distinct value for any reader who is striving to round out his conception of what the war in Europe is like. Such views as the following, for instance developed at greater length by the author, make interesting reading:

The individual German soldier has a sincere and unshakable belief in Adolf Hitler personally; but is often very very skeptical about the other dignitaries of the Nazi Party. This fervent allegiance to Hitler stands out in strong contrast with the German's attitude toward Goering, Hess, Himmler, Ley, and von Ribbentrop. There is also a cleavage in the acceptance of Nazi doctrine. The average German soldier, while deeply loyal to the Fatherland and firm in his conviction that Germany's cause in the war is just, still does not burn with any white flame of fanaticism when it comes to Nazi party principles and ideas. The heavily indoctrinated

young Labor Service personnel were looked upon as unspeakable upstarts by the ordinary soldiers, the result being that the military police had their hands full breaking up fist-fights between the two groups. A notable exception to this rule was the tank corps, who, in contradistinction to the run of the army, were burning, intransigent zealots.

The German pilots have a high opinion of Royal Air Force fighting ability and British antiaircraft gunnery. They spoke admiringly, also, of British planes; but would never admit that the hostile machines were on a par with the Messerschmitt 109 and 110.

An unsuccessful invasion attempt upon England is supposed to have taken place in September 1940, more in the nature of a threat or a diversion than a serious undertaking. British aviation and naval destroyers were said to have broken it up with severe losses to the Germans.

These, and many other reports of similar kind, may well claim the attention of a reader.

WHAT THE CITIZEN SHOULD KNOW ABOUT THE ARMY

By Harvey S. Ford

230 pages . . . New York: W. W. Norton & Company, Inc.

Reviewed by Lieutenant J. J. Gleason, Infantry

Today, when national defense is the primary and growing concern of the American people, there is a distinct place for a book like this which sets forth in clear and attractive style facts about the organization of our army and certain fundamentals of military strategy and tactics. The layman will find it not only easy reading but also a ready source of the military information which he is currently so desirous of securing.

The book contains, of course, little data with which the experienced army officer is not already familiar. For younger officers, however, it has something to offer in its compendious treatment of the various arms and services and in its discussion of the American General Staff system.

WEST POINT IN THE CONFEDERACY

By Ellsworth Eliot, Jr.

491 pages . . . New York: G. A. Baker & Co., Inc.

Reviewed by Colonel Kinzie B. Edmunds, Cavalry

A valuable book in giving in convenient form an account of the West Pointers who served in the Confederate Army; but, in the opinion of this reviewer, not so valuable in its account of the relations between the President of the Confederacy and his principal generals and between those generals themselves. In the latter respect the attempt is made to compress too much in too little space; there is not a chapter devoted to these subjects which could not be expanded into a volume. Conclusions are drawn where only a part of the evidence has been submitted. One gets the impression of opinions formed first, followed by evidence to support them.

Part II of the volume, *Service Records*, including in some cases brief biographies, might well be enlarged to provide greater detail.

AMERICA REARMS; by William T. Stone; 64 pages
LOOK AT LATIN AMERICA; by Joan Raushenbush; 64 pages
SHADOW OVER ASIA; by T. A. Bisson; 96 pages

The Foreign Policy Association

Reviewed by Lieutenant J. J. Gleason, Infantry

A timely brochure, prepared with a close eye for facts, can be a more helpful and convenient source of information than many a larger work which boasts literary embellishment. The three booklets listed above are examples. They give apt caution that a work's being small in compass and cardboard bound is no valid reason for lightly passing it by.

America Rearms is a succinct presentation of the current strategic position of the United States, our vital zones of defense, the planned program of expansion for our army and navy, and our problems of industrial defense production. It is not, of course, an exhaustive analysis of subjects so extensive; but it is a good survey, and quotes salient statistics which will come in handy for anybody who, on short notice, must read, write, speak, or think about the topics mentioned.

Look at Latin America is the same technique, applied to South and Central American geography, economics, and history. There is a valuable outline of the position which the lands to the south of us occupy in the picture of hemispheric strategy, and sound discussion of America's military dependence upon resources which those lands supply.

In *Shadow Over Asia* we find a treatment of the rise of militant Japan, of her plan for a "New Order" in Asia, and her part in today's vast tangle of diplomacy, commerce, and war. The booklet serves the purpose of marshalling in a concise and orderly manner much data which a reader would previously find only in the form of fragmentary journalistic reports.

A happy feature consists of the maps and charts with which all three booklets are liberally supplied. The pictorial charts, in particular, give appreciable reality to financial and trade statistics which would otherwise have an astronomical vagueness.

Directory of Periodicals

Included in this directory are only those periodicals from which articles have been selected. See also "List of Periodicals Indexed and Key to Abbreviations."

MILITARY AND NAVAL PERIODICALS

Joint Forces

Fighting Forces (Great Britain) 119
Journal of the Royal United Service Institution (Great Britain) 120
Journal of the United Service Institution of India (Great Britain—India) 120

General Military

Army Quarterly (Great Britain) 118
La France Militaire (France) 119
Journal of the American Military Institute 120
Krasnaya Zvyezda (Russia) 120
Militärwissenschaftliche Mitteilungen (Austria) 126
Militärwissenschaftliche Rundschau (Germany) 126
Militär-Wochenblatt (Germany) 127
Recruiting News 128
Reserve Officer 128
Revista Militar (Argentina) 128
Revue Militaire Suisse (Switzerland) 129
Wissen und Wehr (Germany) 130

Arms and Services

Air

Aeroplane (Great Britain) 117

Artillery

Coast Artillery Journal 118
Field Artillery Journal 118
Journal of the Royal Artillery (Great Britain) 120

Cavalry

Cavalry Journal 118
Cavalry Journal (Great Britain) 118

Engineers

Military Engineer 127
Royal Engineers Journal (Great Britain) 130

Infantry

Infantry Journal 119

Medical

Army Medical Bulletin 117
Journal of the Royal Army Medical Corps (Great Britain) 120
Military Surgeon 127

Ordnance

Army Ordnance 118

Quartermaster

Quartermaster Review 128

Tanks

Die Panzertruppe (Germany) 128
The Tank (Great Britain) 130

Navy and Marines

Marine Corps Gazette 126
Naval Institute Proceedings 127

GENERAL

Annals of the American Academy of Political and Social Science 130
Foreign Affairs 130
Fortune 130
Harpers Magazine 130
Illustrated London News (Great Britain) 130
Life 131
Nation's Business 131
Proceedings of the Academy of Political Science 131
Round Table (Great Britain) 131
Time 131
U.S. Air Services 131

Catalog of Selected Periodical Articles

This section catalogs the articles selected from Library periodicals for the current quarter. Periodicals in this catalog are arranged alphabetically.

AEROPLANE (Great Britain)

31 January 1941

INDEPENDENT AIR ACTION
TRY IT OUT. By Charioteer

7 February 1941

THE CREDIT OF THE LUFTWAFFE

21 February 1941

THE WAR IN THE AIR
SURPRISES IN THE MEDITERRANEAN

7 March 1941

THE GROWING NIGHT OFFENSIVE
JAPAN'S AIR STRENGTH

ARMY MEDICAL BULLETIN

January 1941

WAR CASUALTIES: LOSSES BY ORGANIZATIONS AND ENGAGEMENT, AMERICAN EXPEDITIONARY FORCE (INCLUDING MARINES), 1917-1918. Colonel A. G. Love (now Brigadier General, Medical Department)

THE MEDICAL OFFICERS' RESPONSIBILITY IN THE PRESENT EMERGENCY. Colonel L. A. Fox

TEN COMMANDMENTS FOR HEALTH:

I Don't take a chance with unsafe drinking water.
Purification prevents disease.

II Don't use unpasteurized milk.
Only the calf can take it raw.

III Don't neglect your diet.
Vitamins mean vitality, but a bulging paunch favors heart failure.

IV Don't use the common drinking cup.
It is as dangerous as a common tooth brush.

V Don't kiss small babies.
If you must spread germs pick one your own size.
VI Don't spray germs.
Your neighbor's face is not to be sneezed at.
VII Don't try to work off a cold.
Relax and let your doctor do the work.
VIII Don't fail to brush your teeth.
And when you are old they will not depart from you.
IX Don't overestimate your strength.
A kiddy-car can't carry the load of a motor truck.
X Don't give your car better care than your carcass.
See your doctor at least once each year.

ARMY ORDNANCE

March-April 1941

EXPORT CONTROL. PROTECTING MATERIALS VITAL TO OUR NATIONAL DEFENSE. Major William S. Culbertson, Reserve Corps

ORDNANCE SERVICE IN OUR NEW ARMY. A BALANCED FORCE FOR FIELD MAINTENANCE AND SUPPLY. Brigadier General James K. Crain

ORGANIZATION FOR PRODUCTION. THE ORDNANCE SYSTEM OF DECENTRALIZED OPERATION

FORGING HIGH-EXPLOSIVE SHELL. CURRENT TECHNIQUE IN MASS PRODUCTION. Arthur F. Macconochie

SYNCHRONIZED ARMS PRODUCTION. MANAGEMENT METHODS MUST AUGMENT THE MACHINES. Sanford E. Thompson

MECHANIZATION ON THE MARCH. (Pictorial)

MASS PRODUCTION OF COMBAT TANKS. A CASE HISTORY OF INDUSTRIAL PREPAREDNESS AT WORK. F. A. Stevenson

AIRCRAFT ARMOR. THE PROTECTION OF FLYING PERSONNEL FROM HOSTILE FIRE. Horace J. Alter.

May-June 1941

OUR ARMS GROW STRONG. A PROGRESS REPORT ON ORDNANCE PRODUCTION CAPACITY. Major General C. M. Wesson

CIVILIAN ORDNANCE TRAINING. A PROGRAM OF PRACTICAL TRAINING TO PRODUCE CAPABLE WORKMEN. Brigadier General C. T. Harris, Jr.

THE ARMORED FORCE. NEWEST FAST-MOVING POWER OF OUR ARMY. Major General C. L. Scott.

BATTLE COMMUNICATIONS. (Pictorial)

PLANNED MUNITIONS. THE BEGINNINGS OF THE ARMAMENT PROGRAM OF 1940. Lieut. Colonel H. S. Aurand

THE ORDNANCE TRAINING CENTER. THE NEW ESTABLISHMENT AT ABERDEEN TO PROVIDE SKILLED OFFICERS AND MEN. Colonel J. S. Hatcher.

ORDNANCE FIELD SERVICE. THE ARMY'S SYSTEM OF ARMAMENT MAINTENANCE AND SUPPLY

ORDNANCE FIELD SERVICE IN THE ARMY OF THE UNITED STATES. (Map)

THE JOHNSON LIGHT MACHINE GUN. Lieut. Colonel C. Goddard

ARMY QUARTERLY (Great Britain)

April 1941

THE WARSAW CAMPAIGN, OCTOBER, 1914. Brigadier General J. E. Edmonds

THOUGHTS ON LEADERSHIP—MILITARY AND CIVIL

THE WAR AT SEA. DECEMBER, 1940-FEBRUARY, 1941

THE R.A.F. IN THE FIRST HALF OF THE SECOND YEAR OF WAR. Air-Commodore P. F. M. Fellowes

GENERAL WETZELL'S PLAN FOR 1914

MOLTKE AND CONRAD. THE PROBLEMS OF HIGHER LEADERSHIP

THE AUSTRIAN PLAN AGAINST RUSSIA, 1914. GENESIS AND ARRANGEMENT FOR GERMAN COOPERATION

CAVALRY JOURNAL

January-February 1941

THE WIDER ROLE OF CAVALRY. Major General R. C. Richardson, Jr.

ARTILLERY, CAVALRY DIVISION. Lieut. Colonel E. A. Hyde

CROSSING RIVERS. Colonel H. D. Chamberlin

SUPPLY OF HORSE CAVALRY REGIMENT. By S-4

THE ARMORED FORCE

OBSERVATIONS OF A BRITISH STAFF OFFICER. (General Hawkins' Notes)

THE THOUSAND INCH RANGE AT THE CAVALRY SCHOOL. Lieut. Colonel Vennard Wilson

COMBATS BY GERMAN CAVALRY REGIMENTS IN THE EAST AND WEST (Foreign Reviews)

TANK ACTION IN FRANCE (Foreign Reviews)

GERMAN CAVALRY DOCTRINE

CAVALRY MOTORCYCLE TROOP. Captain C. P. Bixel

TRAFFIC CONTROL FOR ADMINISTRATIVE MARCHES. Captain Kelso G. Clow

1940 LEADERSHIP TEST, 2D SQUADRON, 12TH CAVALRY. LEADERSHIP TEST FOR SMALL UNITS. Captain C. P. Robbins

STREAMLINED COMMAND AND STAFF PROCEDURE. Cary I. Crockett

HORSES IN CHEMICAL WARFARE. Captain D. L. Mace

March-April 1941

GENERL HEADQUARTERS. Lieut. Colonel C. H. Gerhardt

CAVALRY REPLACEMENT CENTER. Lieut. Colonel W. B. Augur

SELECTIVE SERVICE MEN IN CAVALRY. Lieutenant L. W. Cramer

CAVALRY PACKS. Colonel A. E. Phillips

CAVALRY CAMOUFLAGE IN WINTER. Captain E. C. Sanders

WINTER CAMPAIGNS. Colonel C. A. Romeyn

MOUNTED ATTACK CLARIFIED. (General Hawkins' Notes)

LEADER OR ADVISER? Major General W. J. Snow

THE REMOUNT SERVICE. Colonel E. N. Hardy

THE ARMORED FORCE SCHOOL. Colonel S. G. Henry

SUB-CALIBER DEVICES AT FORT KNOX. Lieut. Colonel L. D. Tharp

THE SECOND ARMORED DIVISION GROWS UP

THE MOTORCYCLE IN MARCH CONTROL. Lieut. Colonel C. R. Johnson, Jr.

FERRYING OPERATIONS. Major A. W. Morse, Jr.

SIGNAL COMMUNICATIONS IN THE FIRST CAVALRY DIVISION. Lieut. Colonel N. L. Baldwin

MEDICAL SERVICE IN FIRST CAVALRY DIVISION. Lieut. Colonel C. W. Riley, and Lieut. Colonel A. G. Heilman

VIEWPOINT OF THE DIVISION QUARTERMASTER. Lieut. Colonel C. C Strawn

SUPPLY OF HORSE CAVALRY REGIMENT. By S-4

COMMUNICATIONS WITH THE 4TH CAVALRY. Lieutenant N. B. Belgrade

THE COMMAND POST OF A CAVALRY REGIMENT (H & M). Captain J. F. Rhoades

CAVALRY'S IRON PONY. Lieutenant G. M. White

THE BANTAM IN THE SCOUT CAR PLATOON. Captain B. Palmer

CAVALRY JOURNAL (Great Britain)

January 1941

TANKS

THE CAVALRY SPIRIT. Reginald Hargreaves

THE OLD HUSSARS. Lieut. Colonel Ernest Ryan

THE FIFTH QUARTER OF THE WAR. By "Observer"

COAST ARTILLERY JOURNAL

March-April 1941

THE WRONG END OF THE TRAJECTORY. Major L. R. Bullene

STREAMLINING THE EFFICIENCY REPORT. Captain R. J. Wood

DOWN MOBILE. Lieutenant Colonel Azoy

PHILIPPINE NATIONAL DEFENSE. Lieutenant Colonel R. M. Carswell.

A TRACER CONTROL TRAINER. Lieutenant Colonel O. D. McNeeley

THE PUBLIC RELATIONS OFFICER. Lieutenant Colonel F. J. Pearson

DRY LAND COAST ARTILLERY. Colonel C. G. Sage

DRIVING IN OPEN TERRAIN. Building Counselor Dischler

FIRST BASE. Anonymous

BERMUDA. Anonymous

THE ABILITY TO LEARN. Fletcher Pratt

FIELD ARTILLERY JOURNAL

March 1941

JAPANESE FIELD ARTILLERY. Lieut. Colonel M. W. Pettigrew

STRATAGEM IN THE NORTH. Colonel Conrad H. Lanza

FIELD ARTILLERY ORGANIZATION, ARMORED FORCE. Colonel F. A. Doniat

THE ARTILLERY IN LARGE ARMORED UNITS. Colonel O. Blatto

SOME THOUGHTS ON EMPLACEMENT OF ANTITANK GUNS. Major Ralph Van Wyck

ARTILLERY HELPS ITSELF. Captain Paul W. Thompson

WARTIME PROCUREMENT OF FIELD ARTILLERY MATERIEL. Major General William J. Snow

SUGGESTIONS FOR EQUITATION INSTRUCTORS. Major Arthur A. Solem

THE CAMP ROBERTS REPLACEMENT CENTER. Lieut. Colonel O. F. Marston

April 1941

PANZERS ACROSS THE MEUSE. A MODERN EXAMPLE OF AN ATTACK AGAINST A RIVER LINE

A SUGGESTION FOR REINFORCEMENT. Captain R. C. Carpenter

BRITISH ARTILLERY IN FLANDERS

MOLOTOV COCKTAIL. Captain J. C. Hooker

RISE AND FALL OF THE AMERICAN "75". Major General William J. Snow

ARTILLERY SUPPORT OF MOTORIZED DIVISIONS

WINGS FOR SANTA BARBARA. Major W. W. Ford

THE FORWARD OBSERVER. A TACTICAL PROBLEM ILLUSTRATING THE

ACTIONS OF A FORWARD OBSERVER, AND HOW ARTILLERY-INFANTRY LIAISON OPERATES IN THE GERMAN ARMY. Major von Ondarza
TRAINING ARTILLERY INTELLIGENCE PERSONNEL
MAKING LATERAL FIRING EASY FOR BEGINNERS. Major K. F. Hausauer
CIRCULAR CONVERGENCE TABLE AND FIRING DATA CARD. AIDS FOR THE BATTERY EXECUTIVE. Lieutenant G. F. A. Pearsall

May 1941

ANTITANK DEFENSE. Major A. C. Wedemeyer
THEY START TO ROLL. Lieut. Colonel E. P. Parker
CENTRALIZED TRAINING. Lieut. Colonel J. V. Delahaye
FIRE DIRECTION
THE VALUE OF ARTILLERY IN MODERN WAR. THE GERMAN VIEWPOINT, AS EXPRESSED IN INFORMATION BULLETIN NO. 160, THE GERMAN EMBASSY, SANTIAGO, CHILE, JANUARY 9, 1941
AN ARTILLERYMAN'S IMPRESSION OF SERVICE IN TOPSY-TURVY LAND. Lieutenant E. A. Raymond
AN EIGHTEENTH CENTURY SPANISH MILITARY CAMP IN PANAMA. Ralph Z. Kirkpatrick
WHAT MAKES AN ARMY? Lieut. Colonel L. M. Riley
GUN PROCUREMENT. THE FRENCH 75 MILLIMETER GUN (THE "SOIXANTE QUINZE"). Major General William J. Snow
ARTILLERY IN ACTION OF THE AISNE ON JUNE 9. (INCIDENTS FROM THE BATTLE OF FRANCE)
ADVENTURE AT JUSSEY. MOTORCYCLE INFANTRY AND ANTITANK GUNS IN COMBAT AT THE RAILWAY STATION. (INCIDENTS FROM THE BATTLE OF FRANCE)
CONDUCT OF FIRE
LEARNING FROM THE ENGINEERS. Major H. D. Kehm
MOTOR MAINTENANCE

FIGHTING FORCES (Great Britain)

February 1941

THE WAR IN LIBYA. Major General H. Rowan-Robinson
PARLIAMENT AND THE WAR. Lieutenant Colonel J. R. J. Macnamara
THE PROMOTION OF CAPTAINS IN THE ROYAL NAVY
NOTES ON THE WAR IN THE AIR
THE GERMAN WAR MACHINE. By the Editor

A critique of the first number of *Bellona*, issued by the Polish General Staff, the principal article being by Major B. Mincer, who claims that the defeat of Poland was due to the invincibility of the German war machine. In this critique, the editor of "Fighting Forces" believes the German war machine is not invincible.

THE NAVY IN 1940
THE ARMY IN 1940
THE AIR WAR, 1940
LINE OF COMMNICATION. Captain M. Trouton
OUR A.A. GUNNERS
ENGLAND IN CONTINENTAL WAR

April 1941

MORE LIGHT ON DUNKIRK
NOTES ON THE WAR IN THE AIR
NAVAL ESTIMATES
ARMY ESTIMATES
AIR ESTIMATES
THE FUTURE OF THE CAVALRY
SALONIKA AGAIN. Kennety Dawson

LA FRANCE MILITAIRE (France)

25 January 1941

WHAT IS EUROPE?
[Qu'est-ce que l'Europe?] By Georges Baron

From a physical point of view, is the eastern boundary of Europe marked, as many geographies indicate, by the Ural Mountains, the Caspian basin, and the Caucasian Mountains?

I do not believe so.

I believe rather that the eastern boundary of Europe is a sinuous line beginning in the region of Königsburg and ending at the Azov Sea.

To the northeast of that line, the beech, that tree so common in Europe, doesn't grow.

From an historical point of view, Europe is the ensemble of territories defended by the Thraco-Illyrians, the Gallo-Romans, the Germans, and the Christianized Slavs, in the course of centuries, against the Asiatic hordes.

To understand this, we must begin by revising our judgements on what many historians call, in bloc, "the barbarian invasions."

The Germans and Slavs who, in the fifth century, fled before the Asiatic invasions, were as authentic Europeans, as the Thraco-Illyrians and the Gallo-Romans who saw them, doubtless with no pleasure, cross their lands or even settle there.

Of course these Burgundians, these Visigoths, these Ostrogoths, these Vandals especially, and even these Franks, were not very civilized; their manners were rough; they had only the most rudimentary respect for the property of others; and only the most elementary admiration for works of art. But, from this, to confound them with the Asiatics who followed them, is at the same time a gulf and an injustice.

The European barbarians allowed themselves to become converted to Christianity and to be assimilated by the Mediterranean civilization; they even paid dearly, subsequently, for the honor of belonging to the European community, by stopping the Asiatic invasions.

These were, in the fifth century, the Franks and the Visigoths who crushed Attila, near Chalons-sur-Marne.

These were in the eighth century, the Visigoths who sacrificed themselves in Spain to slow down the Arab invasion, and these were the Franks who wiped out Abd-er-Rahman north of Poitiers.

These were, in the tenth century, the Saxons who stopped the Magyars at Mersebourg and crushed them at Augsburg.

These were, in the thirteenth century, the Ukranian Slavs who stopped the Tatars-Mongols near the Sea of Azov.

Finally, these were the Germans and Slavs who, in the seventeenth century, stopped the Turks at Saint Gothard, at Vienna, and at Zenta, in the banat of Temesaar [Ancient geographical limit of Hungary—now Yugoslavia.—Translator's Note.]

As for the Asiatic barbarians, with the exception of the Bulgars and the Magyars, they showed themselves as refractory toward Christianity as toward Occidental civilization. The most refractory toward that civilization were the Tatars-Mongols; if they are no longer in Europe as I visualize it, they still exist, under the name of Russians, in the eastern Europe of geographies, in that Volga basin which has nothing European about it.

To tell the truth, in 1485, the Prince of Moscow, Ivan III, of Slavic origin, refused the tribute to the Tatars, and in 1547, Tsar Ivan the Terrible conquered the lands of the Volga; but this was an interior revolution; the Tsar took the place of the Khan; the Russian population remained basically what it had been since 1227, i.e., Asiatic; the presence at Moscow of an orthodox patriarch, torn from his metropolitan see at Kiev in the fourteenth century, added only a thin varnish of Christian civilization.

The efforts of Peter the Great and of Catherine II to open windows on Europe through the Baltic and the Black Sea, were the gestures of Asiatics, maintained on firm ground by the barrage of Poles and Ukranians.

If Kiev, Lwov, Warsaw, Königsburg are in Europe, Moscow is manifestly in Asia, exactly like Astrakhan.

Youth called to "Youth Workshops" may not undertake any school work.
[Les jeunes gens convoqués dans las chantiers de 'eunesse ne peuvent faire aucun acte de scolarité.]

The Youth Secretary has brought to public attention the conditions under which young men and women born between April 1, 1920, and December 31, 1921, will be assembled in the Youth Workshops.

An error crept into this information.

These young people are reminded that during their stay in the Youth Workshops they may not undertake any school work, nor register in any university, nor take any teaching examinations.

On the other hand, for students who are candidates for the "grandes ecoles," [Higher institutions of learning in France, graduates of which may teach in lycees and universities.] There is a possibility of obtaining a delay of one year or two because of studies or examinations, and also the possibility of being called, on their request, whatever be the date of their birth, only on November 1.

INFANTRY JOURNAL

March 1941

THERE WAS A WAR ON. Lieutenant Colonel E. S. Johnston
SINGLE-HANDED. Lieutenant Colonel Dan D. Howe
OUR ORGANIZATION FOR DEFENSE. Hanson W. Baldwin
TRADITIONALISM AND MILITARY DEFEAT. Lieutenant Colonel Thomas R. Phillips
TANKS: ARRAS TO DUNKIRK. (I) Anonymous
SNOW BIRDS
FIRST BASE. Anonymous
A CLEARER VOICE FOR DEMOCRACY. Dr. J. R. Mock and Cedric Larson
THE ABILITY TO LEARN. Fletcher Pratt
FROM THE CHIEF'S OFFICE. The intelligence platoon

April 1941

AIR ASSAULT ON CITIES. Lieutenant Colonel A. M. Prentiss
WHAT HAPPENED AT SEDAN. Captain P. W. Thompson
AIR-LANDING DIVISIONS. Lieutenant Colonel W. C. Lee
SOLDIER AND CIVILIAN IN TOTAL WAR. Dr. H. A. DeWeerd
LOOK ALOFT! Captain C. T. Schmidt
BERMUDA. Anonymous
THE NEW MOBILITY. Captain Hoffman Nickerson
SHORT CUTS IN RIFLE TRAINING. Colonel Bullseye
TANKS: ARRAS TO DUNKIRK. (II) Anonymous

BRITISH ADVICE TO JUNIOR OFFICERS. (International Military Survey)
FROM THE CHIEF'S OFFICE. Antitank-gun company

May 1941

REPLACEMENTS. LIFE-BLOOD OF A FIGHTING ARMY. Major General Fox Conner
MONEY, PRODUCTION, AND TIME. THE THREE VITAL ELEMENTS. (I) Dr. Fritz Sternberg
AROUND THE BASES: JAMAICA. Anonymous
STOPPING THE ARMORED ONSLAUGHT. Major A. C. Wedemeyer
MORALE: FIRST LINE OF DEFENSE. Edward L. Bernays
WHAT A GERMAN SOLDIER THINKS ABOUT. Lars Moën
A PANZER DIVISION CROSSES THE MEUSE. Captain P. W. Thompson
ATTACK HAS A TWIN. ITS NAME IS DEFENSE. Lieutenant Edward Atlas

JOURNAL OF THE AMERICAN MILITARY INSTITUTE

Fall 1940

SPENSER WILKINSON AND THE DEFENSE OF BRITAIN. J. M. Scammell
THE FRENCH DISCOVERY OF CLAUSEWITZ AND NAPOLEON. Dallas D. Irvine.
AMERICAN MILITARY DRESS IN THE WAR OF 1812. III. REGULAR INFANTRY. Hugh Charles McBarron, Jr.

Winter 1940

NATIONAL DEFENSE: A PROGRAM OF STUDIES. Edward M. Earle
THE ENGLISH SOLDIER IN THE CAMPAIGN OF AGINCOURT. III. THE BATTLE OF AGINCOURT. Wilfred B. Kerr
MILITARY PUNISHMENTS IN THE WAR OF 1812. John S. Hare

MILITARY AFFAIRS
Journal of the American Military Institute
(Name changed with this issue)

Spring 1941

ROOTS AND IMPLICATIONS OF THE GERMAN IDEA OF MILITARY SOCIETY. Albert T. Lauterbach
SOCIAL AND POLITICAL ASPECTS OF CONSCRIPTION: EUROPE'S EXPERIENCE. Herman Beukema
THE MODERN ITALIAN NAVY. I. BEFORE 1900. Theodore Ropp

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS
(Great Britain)

January 1941

THE USE OF PLASMA. Colonel L. E. H. Whitby
ARMY BLOOD TRANSFUSION SERVICE TECHNIQUE FOR THE FILTRATION OF BLOOD PLASMA. Quartermaster Sergeant S. R. M. Bushby and Colonel L. E. H. Whitby
GUNSHOT WOUNDS OF THE HEAD IN 1940. Colonel Hugh Cairns

March 1941

FOODS: USE OF POTATO FLOUR. (Editorial)
A PORTABLE DISINFECTOR. Major B. Bennett [See "Foreign Military Digest"]

JOURNAL OF THE ROYAL ARTILLERY (Great Britain)

January 1941

Cambrai, 1917. The tanks at Flesquières on the 20th November. Major A. F. Becke

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION
(Great Britain)

November 1940

MEETING TO COMMEMORATE THE CENTENARY OF THE BIRTH OF ADMIRAL ALFRED THAYER MAHAN, U.S.N. ON FRIDAY, 27TH SEPTEMBER, 1940, AT 3 P.M. Admiral Sir William E. Goodenough.
THE FIRST YEAR OF THE WAR, 1939-40: At sea; On land; In the air
THE ART OF SURPRISE. Lieutenant-Colonel A. G. Armstrong
NAPOLEON'S COUNTER BLOCKADE
ARMY AND AIR FORCE CO-OPERATION. Captain F. R. G. Milton
PALESTINE, 1918—FRANCE AND BELGIUM, 1940. By "W.A.T.E."

February 1941

THE HIGHER COMMANDER. General Wavell's views
HOW HAVE THE LESSONS OF THE WAR OF 1914-1918 BEEN CONFIRMED OR MODIFIED BY THE EXPERIENCES OF THE PRESENT WAR UP TO DATE? [Trench-Gascoigne Prize Essay.] Major Frederic Evans
THE TACTICS OF THE BLITZKRIEG. Major M. P. Huthwaite
THE INFLUENCE OF AIR FORCES ON THE COURSE OF THE WAR. Captain Norman Macmillan
THE TOLL OF OUR ANTI-AIRCRAFT BATTERIES
A CENTURY OF THE CHINA STATION. Frank C. Bowen
SOME LESSONS OF THE LAST WAR. Brigadier-General W. D. Croft
THE BALTIC AS A THEATER OF WAR. THE CAMPAIGN OF 1854. Lieutenant R. F. Colvile
THE CORPS OF THE WHITE COCKADE. Lieutenant-Colonel M. E. S. Laws
THE WORK OF THE N.A.A.F.I. ENTERTAINMENTS BRANCH. Claude F. Luke
DIARY OF THE WAR, 1940-41

JOURNAL OF THE UNITED SERVICE INSTITUTION OF INDIA
(Great Britain—India)

January 1941

LAND WARFARE. Brigadier E. E. Dorman-Smith
AN INTERLUDE IN THE CAMPAIGN IN NORWAY. By an Indian Army Officer

KRASNAYA ZVYEZDA (Russia)
BY LIEUTENANT JOSEPH DASHER, O. R. C.

5 September 1940

Offensive action by reinforced regiment.
[Nastuplenye usilennovo polka.] Captain S. Sapigo
Episodes from Red Army field maneuvers.

12 September 1940

Cooperation on antiaircraft artillery with pursuit aviation.
[Vzaimodeystvye zenitnoy artillerii s istrebitelnoy avyatsyey.] Major A. Rebryev

Pursuit aviation is the main agency for combatting the aerial enemy. At the same time antiaircraft artillery, being the powerful ground fire agency, forms the foundation of antiaircraft defense. There is need for the closest cooperation between these two.

These are the principle forms of cooperation of antiaircraft artillery with pursuit aviation: the distribution of zones according to terrain or altitude; joint action in the zone of artillery fire. The selection of one or the other form of cooperation is determined by many factors, such as: the size of the defended object and its distance from the enemy airdromes; the number of agencies designated for the defense of a position or of troops; the efficiency of liaison; the degree of training of antiaircraft personnel for joint action, etc.

In distributing zones in accordance with terrain, the entry of pursuit aviation into the zone of antiaircraft artillery may be forbidden. In such cases the organization of joint action is not especially difficult, but at the same time will be of low effectiveness.

When zones are distributed in accordance with altitude, the actions of pursuit aviation will take place beyond the range of artillery fire, i.e., at altitudes of 6,000-8,000 yards. In this case it is necessary to indicate, whether in pursuing the enemy, the aircraft may continue to attack below the 6,000 yard altitude. Of course this will depend on the general situation, but aviation should not be too rigidly limited.

Thus, in distributing the zones of action according to terrain or altitude it is necessary, as a rule, to permit pursuit aviation to continue attacks in the zone of antiaircraft fire. This means that combat activity of both agencies in one zone is the fundamental form of their collaboration. Should the enemy aircraft attain tactical surprise of attack, then the collaboration of pursuit aviation and antiaircraft batteries within one zone will be the sole effective method.

AERIAL LANDING PARTIES AND ACTION AGAINST THEM.
[Vozdushniye desanty i bor'ba s nimi.] Major V. Nikulin
(See Digest, *Military Review* No. 80, March 1941, page 45.)

13 September 1940

GERMAN SIGNAL FORCES.
[Germanskiye voyska svyazi.] From German sources
(See Digest, *Military Review* No. 80, March 1941, page 57.)

18 September 1940

OBSERVATION IN COMBAT.
[Nablyudenye v boyu.] Major P. Kolomeytsev

The system of observation should be so erected as not to disturb it during the progress of the engagement. The transfer of OP's, the

organization of liaison with them at all stages of the engagement—all of this is carefully worked out by every unit commander and every headquarters. Visual signalling should be widely utilized for communicating the results of observation. This is especially important for small units which lack technical signal equipment.

23 September 1940

TANK RECONNAISSANCE DURING THE MARCH.
[Tankovaya razvyedka na marshe.] Colonel I. Ziberov

Tank reconnaissance during the march has a number of advantages over that on horse or on foot. As a result of their great mobility and depth of action, armored units can gain quick contact with the enemy where there are no artificial obstacles or defensive zones. The personnel of such units, protected by armor, is able to function with success in the sphere of rifle and machine-gun fire. However, it should be borne in mind that the combat activity of such units depends to a great extent on the relief and nature of the terrain, and that tank reconnaissance is exremely difficult to conceal.

Typical tactical reconnaissance elements of a tank unit will be groups, and individual patrols, conducting reconnaissance in definite directions and of definite objects. The composition of a reconnaissance group depends on the situation. It may consist, for instance, of a tank company, or of armored vehicles with motorcyclists, chemical operators and signal agencies. It should not separate itself from the main forces by more than 20 or 25 miles. The individual reconnaissance patrol will go forward for 10 or 12 miles and usually will consist of a platoon of tanks or gun-carrying armored vehicles, reinforced by a few light armored cars, motorcycles, etc.

27 September 1940

AIR INFANTRY.
[Vozdushanaya pekhota.] Colonel V. Lozovoy-Shevchenko
(See Digest, *Military Review* No. 80, March 1941, page 41.)

28 September 1940

ATTACK ACTION BY AVIATION.
[Shturmoviye deystvya avyatsii.] Captain Rodyonov

The Soviet Bombardment Aviation Field Manual provides that bombing planes shall be utilized on attack missions in following circumstances:

(1) In a poor meteorological situation.
(2) Against small or narrow targets.
(3) Against troops in movement or on the battlefield.
(4) In those cases when the employment of attack aviation insures the greatest chance of avoiding counteraction by strong anti-aircraft artillery.

The Soviet Pursuit Aviation Field Manual provides that pursuit aircraft participate in an attack "when it is necessary to utilize all the available combat agencies against large groupings of enemy troops discovered in the most important operative sectors, and in certain instances also for supporting the attack of our own troops, for delaying the enemy's retreat, or for protecting our own troops from pursuit by the enemy."

After discussing the technical merits and shortcomings of bombing and pursuit craft when engaged in attack action, the author concludes that special attack aviation is indispensable.

Single seater ships, armed with machine guns and cannon, can be successfully employed in attack aviation, but they must be able to carry a bomb load of 220 to 330 pounds. Obsolescent pursuit ships may be successfully transformed into attack craft. However, the most adaptable craft for attack are fast, highly maneuverable, two-seater planes.

2 October 1940

CAVALRY MARCH TRAINING.
[Marshevaya podgotovka konnitsy.] Colonel M. Moiseyev-Cherkasskiy
(See Digest, *Military Review*, No. 80, March 1941, page 52.)

6 October 1940

ITALIAN OPERATIONS IN THE ALPS.
[Italyanskiye Operatsii v Alpakh.] Captain N. Andreyev
(See Digest, *Military Review* No. 80, March 1941, page 57.)

15 October 1940

THE OFFENSE IN THE MOUNTAINS.
[Nastuplenye v gorakh.] Colonel S. Agapov

Defense in the mountains is based on the principle of the deep echelon. Combat groups, reinforced by machine guns, mine throwers, and at times also by individual guns, will be placed on all the strategically important peaks. The advancing force will repeatedly collide with such reinforced security units.

Such a defensive organization will, of course, complicate the problems of the force engaged in offensive action. Scores of examples are known, wherein the energetic actions of small defensive units, frequently changing their positions, and the transformation of individual guns into those of the "roving" variety, have confused the advancing enemy, and have prevented him from ascertaining whether or not he has reached the main line of resistance. In one such exercise, for instance, two infantry platoons, reinforced by 4 machine guns on fixed mounts, 4 mine throwers and 2 mountain guns, have forced the deployment of first the advance guard battalion, and finally the entire regiment with two artillery battalions.

The author recommends the following: in front of the advance guard battalions along mountain ranges, spurs, and ridges, there should proceed combat reconnaissance units, reinforced by individual guns, mine throwers, and also by engineers, the latter to designate and mark the routes for the column. The fundamental purpose of this reconnaissance will be to capture all the peaks in the area of the unit's offensive action.

When assigning tanks for support of the infantry, forethought must be exercised as to areas not easily accessible to tanks. Otherwise tanks may fall behind and will not be able to participate in the action.

18 October 1940

TANKS IN PURSUIT.
[Tanki v presledovanii.] V. Obukhov

Experience shows that the retiring enemy will install obstacles to cover his retreat. In this case tank units designated for pursuit action should be reinforced by motorized infantry, antitank guns, motorized artillery, and engineer units. It is most advisable to employ tanks for deep flanking movements and for attacking the enemy from the rear and flank, i.e., for parallel pursuit. Infantry will be most effective when in frontal advance.

The success of pursuit action depends on cohesion between tank units, combat aviation and infantry. The tanks should not separate themselves from their infantry for distances greater than 40 to 45 miles. This norm consists of a forced march of the infantry (up to 30 miles), and the depth of the retreating enemy column (average 10 to 15 miles).

22 October 1940

CERTAIN CONCLUSIONS FROM AIR FORCE ACTION IN THE WEST.
[Nekotoriye vyvody iz deystviy avyatsii na Zapade.] Colonel M. Nikolskoy

In this article are indicated the differences in the methods used by the German air force in the operations against Poland, Norway and the low countries. Operating independently or in cooperation with ground forces, the air force has proved to be of decisive influence in all operations except against naval forces.

SOVIET MILITARY DISCIPLINE AND DISCIPLINARY PENALTIES.
[Sovyetskaya voinskaya distsiplina i distsiplinarniye vzyskanya.] General V. Ulrikh

An extremely significant article, testifying to the profound changes which are taking place within the Red Army.

The author, Judge Advocate General of the Red Army, points out that heretofore military discipline in the Red Army was administered on the basis of a "temporary" code, enacted in 1925. According to him, the changes effected through the adoption on 12 October 1940 of a new "Disciplinary Regulations of the Red Army," have been brought about by a succession of events, culminating in the introduction of conventional ranks for Red Army officers, including those for general officers, and the adoption of the principle of singleness of command, as differentiated from the heretofore divided authority between the commander and the political commissar.

The new "Disciplinary Regulations," the author continues, regulate clearly the mutual relations between the Red Army officer and the subordinate (enlisted man). Under the principle of singleness of command, the Red Army officer is the sole leader of troops, and his order is law which the subordinate must obey unreservedly and without delay.

The new "Regulations" grant broad powers to the Red Army officer. In the event of disobedience, open resistance or malicious breach of discipline, the officer possesses the right to use all measures of compulsion, including arms. The officer shall not be responsible for the consequences if, for the purpose of restoring discipline, he will be compelled to use force and arms. The "Regulations" go even further in this regard by declaring that any officer who fails to show "toughness and decision" and who does not use all measures assuring the execution of his order will himself be tried by a military tribunal.

The purpose of the new "Regulations" and the many recent orders of the Peoples' Commissar of Defense, Marshal Semyon K. Timoshenko, is to instill in all ranks of the Red Army the realization that the officer's order is law to the subordinate, and that all "familiarity and pseudo-democracy" in the relations between the officer and his subordinate cannot have place in the Red Army. Subordinates (enlisted men) are absolutely enjoined from even so much as discussing any order.

In order to prevent the court martialing of officers without sufficient cause, Article 15 of the Disciplinary Regulations provides that this may take place only upon permission of the Peoples' Commissariat of Defense (Soviet War Office).

The list of punishments for enlisted personnel follows: Personal reprimand; reprimand before ranks; suspension of leave for a period of up to six weeks; extra duty (not exceeding 8 successive periods of such duty); ordinary arrest and confinement to guard house for a period of up to 20 days; "strict" arrest and confinement to guard house for a period of up to 10 days; trial by a court of fellow soldiers.

For noncommissioned officers the punishments are: Personal reprimand; suspension of leave for a period of up to one month; extra duty (not exceeding 8 successive periods of such duty); reprimand with publication in daily orders; ordinary arrest and confinement to guard house for a period of up to 20 days: "strict" arrest and confinement to guard house for a period of up to 10 days; trial by a court of fellow noncommissioned officers; reduction in rank; degradation in rank.

On noncommissioned officers serving on reenlistment—in addition to personal reprimand and reprimand with publication in daily orders, reduction in rank and trial by a court of fellow noncommissioned officers—the following disciplinary punishments may be imposed: Forfeit of regular leave for a period of up to 15 days; ordinary arrest at the guard house, involving the performance of duties, and forfeit of 25% of daily pay for each day of arrest, the amount to be deducted from base pay; "strict" arrest at guard house (excluding the top rank of NCO) for a period of up to 10 days, without performance of duties, and forfeiture of 50% of daily pay for each day of arrest, the amount to be deducted from base pay.

In addition to personal reprimand, reprimand with publication in orders, forfeit of regular leave for a period of up to 15 days, reduction in rank and in post, the following punishments may be imposed on officers of the middle and senior ranks (company and field officers): House arrest for a period of up to 15 days, involving the performance of duties, and the forfeiture of 50% of daily pay for each day of arrest, the amount to be deducted from base pay; delay for a period of one year in normal promotion, according to seniority; trial by a court of honor, composed of fellow officers, forfeit for a period of six months of normal seniority increase in pay; removal from command; transfer to reserve or retirement.

Officers of senior ranks may be punished as follows: Warning; personal reprimand; reprimand with publication in orders; forfeiture for a period of six months of normal seniority increase in pay; removal from command; transfer to reserve or retirement.

According to the new "Disciplinary Regulations," a regimental commander may in time of war—and in urgent cases also in time of peace—relieve from duty officers of ranks up to and including company commanders.

There is no right of appeal against the severity of punishment.

23 October 1940

SECURITY FOR ANTIAIRCRAFT ARTILLERY AGAINST AERIAL ATTACKS.

[Protivovozdushnoye obespechenye zenitnoy artillerii.]

Colonel S. Ternikov

Special tactics are being employed of late by aviation in the various theaters. Because of this, changes are taking place in certain heretofore established views on the tactical utilization of antiaircraft artillery and its firing methods. This has become most evident in connection with dive bomber attacks.

Almost always a war creates new tactical methods in the conduct of combat, but countermeasures to cope with such new methods are not always well timed. For example, these can serve the action against the so-called counter-antiaircraft artillery echelons, which is widely practiced in the air forces of all armies. In Spain and elsewhere these echelons were not always met by organized and effective fire resistance on the part of antiaircraft artillery. Most frequently aviation was able to execute its combat mission, i.e., to bomb the principle object, almost with impunity, if it succeeded in prior silencing of antiaircraft defense. This alone shows the importance of considering all details of the problem of action against those enemy air attacks which are directed against ground antiaircraft defense elements. The organization of the defense of antiaircraft artillery against attack from the air is most important.

At present it is difficult to conceive of any major operation without the mass employment of air elements. In order that aviation may be employed with the greatest effectiveness, it is first of all necessary to silence the enemy's antiaircraft defense. A glowing testimony to this is given by the most recent military action in Europe and Africa. Thus, for instance, Germany in her efforts to gain control of the air, is directing her aerial attacks with increasing frequency against England's antiaircraft defense system and particularly against antiaircraft artillery installations. Suffice it only to point to the raids on English antiaircraft artillery emplacements at Killingholm and in the vicinity of Thames Haven on 4 August, the silencing of antiaircraft batteries near Liverpool, Bristol and in the south of England on the night of 8 August, to say nothing of almost nightly raids on London's antiaircraft defense system.

England, too, has conducted a number of raids by bombing planes on German antiaircraft batteries. Of particular importance, because of their extent, were the English attacks on 25 July on Hamburg and other cities. On 8 August, English aircraft were attacking German antiaircraft batteries at Duisburg. On the night of 9 August a large quantity of bombs was dropped on the antiaircraft batteries in the Tiergarten in Berlin and a number of other places.

The general outline of such air action is the following: The location of enemy antiaircraft elements, mainly antiaircraft artillery, is established in advance on the basis of air reconnaissance and analysis of earlier intelligence. Thereupon action is organized to destroy certain objects, and to silence the system of antiaircraft defense. The solution of both problems takes place simultaneously and in such manner as to preclude a revival of antiaircraft batteries and other elements at the very moment when the aircraft is ready to proceed with the bombing of the objects protected by such batteries or elements. Because of these considerations it must be expected that enemy aviation will attack more than once and will employ echelon tactics. War experience shows that the three-echelon method in aerial attacks, has become characteristic.

The first or challenging echelon, consisting of 6-9 bombers or attack planes, protected by 12-15 pursuit craft flying some 500 meters above the echelon, proceeds at a relatively high altitude (3,000-5,000 meters). The planes then drop to 1,500-1,200 meters and bomb objectives earlier designated for this purpose. This is done mainly in order to attract the fire of as many antiaircraft emplacements as possible, and thus to establish their location and concentration.

Behind the challenging echelon, at a distance of 5-6 kilometers, there follows the second echelon consisting of 9-12 fast bombers without any protective aircraft. This echelon proceeds at an altitude of 3,000-5,000 meters, and it has the specific mission to silence the antiaircraft batteries just located. The characteristics of this second echelon, as of the first, is that its action is full of risk and must be extremely speedy and audacious.

Behind the second echelon, and close upon its heels, there appears the third echelon, designated for the destruction of objects. It consists of 12 to 15 bombers, accompanied by 20 to 25 pursuit ships. This is the main echelon, which will execute the principle mission, i.e., bomb the respective objects under conditions of almost complete impunity.

Although somewhat different methods have been observed in aerial tactics, nevertheless basically they did not differ from the method here described, even at night.

Thus the enemy will strive to disorganize, suppress and silence the antiaircraft defense system. Hence there is the need for a carefully organized counteraction. A situation must be created in which there would not be even a temporary suspension in the activity of this system, and especially in that of antiaircraft artillery. To achieve this a number of measures will be needed which should be included in the plan of the higher commander.

The plan should provide for special reconnaissance with the mission to find enemy directing agents working at night with flash signals, as well as for the reconnaissance of enemy airdromes for determining the enemy's intentions and his preparations for air raids. Reconnaissance results should be communicated without delay to the antiaircraft artillery command, down to battery commanders. Of great importance are questions of cooperation between pursuit aircraft and antiaircraft artillery.

In planning antiaircraft fire for both day and night, consideration must be given to action against the second echelon of enemy aircraft. Not only the methods of fire, but also the mutual relief between batteries should be determined in advance. This will be promoted by closer concentration of antiaircraft artillery emplacements.

Taking into account modern air tactics, methods of bombing and the radii of bomb flight it must be recogonized that the checkerboard formation is most advantageous for antiaircraft artillery in position. Intervals and distances are partly determined by the importance of the defended object. In any event, intervals between antiaircraft batteries should not be less than 500 meters, and distances should not be less than 1,000-1,500 meters.

In his activities against antiaircraft batteries the enemy will frequently employ smoke. Preventive measures against it will include the installation of special buoys and orienting points, which will enable gun crews to continue action even in the midst of smoke. Proper slide rules and other apparatus needed for firing into heavy clouds must be prepared in advance.

Of special importance is the camouflaging and the engineering arrangement of the firing positions of antiaircraft artillery. Simulated positions should be employed. The battery command post, with its optical instruments, should be located sufficiently far away from the guns, but in such manner as not to impair fire direction. According to this, the construction of trenches at the battery CP is changed. Deep trenches should be dug for the optical instruments for fire direction and observation.

Daily change of firing positions of antiaircraft artillery should be prepared for almost every day, as a rule. After every air raid the change of position is compulsory. Battery maneuvering will take place at night. All this proves how important it is to select reserve positions for batteries and artillery battalions, and how efficient the change of position must be. The maneuvering of batteries and other antiaircraft elements is an effective method for counteracting the second air raid echelon.

In case bomb hits are registered directly on the firing position, the battery must not cease fire. Every other consideration should be subordinated to the necessity of executing the combat mission, which in this case is fire against enemy aircraft. Only in the event of clear necessity, as for instance, heavy losses of personnel, should the battery commander order his battery to take cover. All this goes only to prove how vitally important is the self-control, perseverance and

endurance on the part of gun crews, and how highly trained they should be. The commanders of antiaircraft batteries must be able to judge quickly and soundly the changing conditions of combat, and to show the maximum of initiative.

Recent analysis of aviation in combat shows that frequently its action against antiaircraft defense becomes an independent operation. In Western Europe there were cases of employment of groups of aircraft for breaking through antiaircraft defenses, although no detailed information on such groups is as yet available.

25 October 1940

BRINGING THE SHOCK GROUP OF A DIVISION INTO COMBAT DURING DEFENSIVE ACTION.
[Vvod v boy udarnoy gruppy divizii v oboronye.] Major General P. Yarmoshkevich

If the enemy has penetrated and is not stopped and liquidated, despite all the defensive fire and local counterattacks, the decisive moment will arrive when the shock group of a division will enter the engagement. This moment will be slow in arriving, and will offer the greatest advantage after the enemy will have suffered heavy losses at the hands of stubborn defense; when his combat formations will have been disorganized, and when his artillery support will have weakened in connection with change of position by the batteries.

The entry of the shock group of the division into combat may be preceded, if conditions are favorable, by an effort of the regimental shock group towards the liquidation of the breakthrough, within the sector of the respective regiment. If a local counterattack should prove without avail, or if it should fail, the regimental shock group will then assume the defense of the position prepared in advance, and will resist further efforts of the enemy to extend the penetration. At this stage of combat, the entire regimental sector will strive to build a curtain of fire in the region of penetration and will strive to maintain its position. The artillery's mission is to prevent enemy reserves from reaching the point of penetration.

26 October 1940

MECHANICAL PRIME-MOVERS FOR ARTILLERY.
[Mekhanicheskaya tyaga artillerii.] Army Engineer Prof. F. Khlystov

Field artillery should have not only fire power, but maneuverability as well, as required by conditions of modern combat.

Tractor types should be established for the following classifications of artillery: infantry battalion and regimental artillery, artillery battalion, antiaircraft, corps and heavy artillery.

In weight such tractors should be: light, up to 5 tons; medium, up to 10 tons; heavy, over 15 tons. In addition to these, command reconnaissance cars and ammunition and artillery equipment trailers will be needed.

Following are the demands placed on the mobility of artillery prime-movers: motorized units and auto-columns, 20-30 kilometers (about 12 to 18 miles) per hour; tank units, 12-20 kilometers (7½ to 12 miles) per hour; normal distance covered in 24 hours by a tank unit, 80-100 kilometers (about 50 to 60 miles); distance covered in 24 hours by a tank unit, under forced march conditions, 130-150 kilometers (about 80 to 95 miles).

AVIATION CAMOUFLAGE.
[Maskirovka avyatsii.] Army Engineer E. Yasin

These are the basic methods of aviation camouflage: (1) Camouflage of permanent and operative airdromes with their structures and equipment; (2) The reduction of visibility and ease of recognition of aircraft in the air, from enemy aircraft flying at higher altitudes; (3) The reduction of visibility and ease of recognition of aircraft in the air, from enemy aircraft flying at lower altitudes, also from the ground against a clear sky or clouds; (4) Camouflaging night flying aircraft with the view of rendering them wholly invisible, either from ground observation or in searchlight rays; (5) The creation of simulated airdromes.

12 November 1940

ATTACK FROM LEVEL FLIGHT.
[Shturmovat' na breyushchem polyotye.] Major D. Oseled'ko

In spite of recent furore created by dive bombers, sight should not be lost of the possibilities of aerial attack from level flight. The favorable features of this form of attack are: better marksmanship in bombing, especially against narrow targets; better marksmanship in machine-gun and cannon firing with grazing fire; the opportunity to use topographical features as camouflage in flying towards a target. The attack from level flight excludes the possibility of artillery fire from the ground, and renders difficult the fire of small caliber artillery, machine guns and rifles.

The level flight is also advantageous due to the fact that low flying aircraft are less vulnerable to enemy pursuit. The level flight method enables the simultaneous attack of one target by large forces. This differs from dive bombing, and is also feasible under unfavorable meteorological conditions (low ceiling), which is most important to the continuity of aerial action.

The negative features of level flight attacks are: limited horizon, which creates the danger of attacking own objects instead of the enemy's; vulnerability to antiaircraft artillery, if the element of suddeness is lost, and the extreme strain imposed on the physical endurance of personnel. Also, all artillery and mine-thrower fire must be suspended while own aircraft attacks the enemy.

The ideal attack plane, for level flight attacks, will be armed with machine guns and cannon, and will carry an appreciable bomb load. Of special importance will be the construction of bomb racks, to assure bombing in long series. The bomb load should be 600-700 kilograms; the armament—1-2 guns, 4-6 machine guns; effective range—300-400 kilometers (185 to 250 miles); speed over ground—500-550 kilometers (about 310 to 345 miles) per hour; crew—2-3. Two air-cooled motor craft is the type most desired for the purpose.

THE ARTILLERY OF ANTITANK DEFENSE.
[Artillerya protivotankovoy oborony.] From French sources.

The missions which in 1940 were assigned to antitank artillery, were numerous and more complicated than those of 1914-18. It was but infrequently that the French defense had a solid line of trenches and antitank obstacles. Often the defense was organized on open terrain, when it was necessary to block the enemy from reaching bridges, and to fight enemy tanks on city streets. Sometimes it was necessary to fire on one or two isolated 80-ton tanks, or on a large number of armored vehicles. During retreat, there were cases when the attack was expected to be by tanks but was executed by infantry, which was moved up on trucks, motorcycles or bicycles. Each of these cases required the use of different means and different tactics.

Guns constructed especially for action against tanks (25-mm and 47-mm guns), also field artillery (various types of the 75-mm and 105-mm guns), and tanks, were used as antitank means.

The 25-mm and 47-mm guns possess high initial velocity and a shock action shell. The shells have a high power of penetration, but against infantry they are totally ineffective. The 25-mm gun is light and mobile, it can be moved by hand, and is drawn by any motor vehicle with a towing hook. Even a motorcycle with a side car was used as a prime mover for this gun. The 47-mm gun is more powerful and proved effective against the 80-ton tanks. Low elevation of this gun facilitated its camouflage, but it weighs almost as much as the 75-mm gun.

In position warfare, on a stabilized front, these antitank guns could have played an important part, but they were totally worthless for a war of maneuver. For instance, it was impossible to leave such a gun for the defense of a bridge because a small enemy infantry unit would capture it without special effort. As a result many such antitank guns finished their participation in the war without firing a single shot.

Due to its limited mobility, low firing speed and the difficulty of bringing up its ammunition, the 155-mm howitzer could not be used for firing on tanks with direct aim. Some difficulties, though in a lesser degree, were experienced with the 105-mm guns.

The old 75-mm gun, 1897 type, was always dependable and gave a good account of itself in antitank action. It was even reported that this gun was the only effective means against 80-ton tanks.

The universality of the 75-mm gun was of tremendous advantage during retreat. On this gun missions were placed of defending approaches to a bridge, and it could be used against any targets: 80-ton tank, light tank, armored car, motorcyclists, bicyclists, cavalry, infantry. It was of aid to infantry in every situation.

There was an instance when a bridge was being defended by two well placed 75-mm guns. In spite of absence of infantry these guns repulsed all enemy efforts to cross the bridge. In many cases the attack was broken up at the very approach to the bridge. A case is known when a 75-mm gun destroyed a reinforced concrete bridge by firing from the bank point blank into the bridge abutments. All types of 75-mm ammunition were available in abundance, but in spite of all this the gun is heavy and unwieldy, and the ammunition is difficult to bring up.

For antitank action the 75-mm gun had the Arbel platform, and a shoe clog under its coulter. These would have been needed for position warfare, but proved useless and cumbersome in a war of maneuver.

The new gun, with the extensible mount, proved most convenient, although the change from firing into marching position, and vice versa, was slow and not without difficulties.

16 November 1940

REVIEW OF WARFARE IN CHINA.
[Obzor voyennykh dyeystviy v Kitaye.] P. Kraynov

Since the incident at Marco Polo bridge 40 months have elapsed. During this time, according to Chinese sources, Japan has sent 42 army divisions to China. The Japanese casualties have reached 1,500-000 (the Japanese admit losing 1,000,000 men). A total of 16 billion yen has been spent by Japan on the Chinese war, which is ten times greater than her expenditures in the Russo-Japanese War.

During the recent period, since the stabilization of the fronts (latter part of 1938), no vital changes have occurred in the nature of the war, which the foreign press is characterizing as being "stationary." The present Japanese effort to the south reflects itself on the progress of the war in China.

23 November 1940

SHRAPNEL FIRING.
[Strelba shrapnelyu.] Colonel I. Krivtsov

As a means of inflicting damage upon the enemy shrapnel has not lost its importance, even today, though there may exist contradictory opinion in this regard.

During the period of World War I, the combat supply of Russian field artillery consisted of more than 50% shrapnel. Shrapnel then was the principal shell. On 15 August 1914 at Tomaszow, one of the best infantry regiments of the Austro-Hungarian Army, while deploying for action found itself under the shrapnel fire of two Russian batteries of Cossack artillery. Within two or three minutes after the opening of fire the Austrians were in precipitate retreat, leaving about one thousand bodies on the battlefield.

During the initial stage of the Soviet-Finnish War on the Karelian Peninsula, Finnish snipers, stationed in tree-tops, were inflicting heavy damage on Soviet troops. To combat them the Russians employed shrapnel shells which were effective in "combing" through the upper portions of woody terrain. Action of this type may be expected on other fronts as well.

The author concludes that these examples serve to prove his argument that shrapnel has not outlived its usefulness.

29 November 1940

ATTACK AVIATION ABROAD.
[Shturmovaya Avyatsya za Rubezhom.] Major V. Nikulin

In spite of the fact that neither the British nor the German air forces possess attack aviation within their organic organization, attack action by aircraft has been rather widely employed during the present war.

At present only the air forces of the U. S. A. and of Italy have attack aviation.

The attack aviation of Italy consisted of two air regiments, each armed with 60 aircraft. During the early days of Italian attack aviation it used the ordinary pursuit craft, but this was later substituted by the Breda-65 and Breda-88 attack craft. The Breda-65 has an Isotta-Fraschini motor of 870 HP, with a speed of up to about 265 miles per hour. It is armed with four stationary machine guns for direct fire, one turret machine gun, and it carries a bomb load of 400 kilograms. The Breda-88 is a twin-motored monoplane with a Piaggio air-cooled motor of 1,000 HP, and it is the more modern of the two types. This plane develops a speed of about 340 miles per hour, and is armed with 3 heavy caliber machine guns for direct fire, and one turret machine gun. It can be used also as a heavy pursuit plane and bomber.

From this it appears that attack aviation of foreign armies—as an independent aviation arm—is weakly developed.

The air attack units, existing in the U. S. A. and in Italy, are not equipped with special craft, distinctly different from the ordinary bomber. In addition to this, the author points out, the American attack aviation is being reequipped with bombers, which merits special attention.

At the same time the experience of the present war has shown that attack aviation can be widely employed. Both the Germans and the British are employing low level flight attacks, with light and heavy pursuit planes, as well as light and medium bombers.

During the war with Poland the German air force made wide use of attacks upon troops on the march, troop trains and troop bivouacks. Attacks were also executed against Polish airdromes. The low-flying craft created a strong moral effect on the unsteady Polish infantry. Most widely used for this purpose were the Messerschmitt-110 twin-motored pursuit planes and the single-motored Heinkel-123 pursuit ship. The Junkers-87 dive bombers were also partially used.

In Norway the German air force was actively engaged against British landing parties, and in interfering with the evacuation of British forces. The cannon fire from the Messerschmitt-110 pursuit ships, and the Junkers-87 dive bombers, proved to be sufficiently effective against the small shipping which participated in English evacuation. Similar actions were accomplished by the Germans during the Allied evacuation from Dunkirk.

During the engagements at Cambrai of large mechanized units both sides widely employed attack aviation. The British used for this purpose the light, single-motored bomber "Fairy," with a speed of up to about 255 miles per hour.

This type of attack is being increasingly used by the Germans in their air action against England. As was the case during World War I, the necessity of striking small targets requires the aircraft to attack from level flight and from low altitudes (50-100 meters). It is well known that the quite well developed British antiaircraft defense prevents the German bombers from carrying through their operations from medium altitudes. Bombing from altitudes of 5,000-6,000 meters and higher is insufficiently exact. This has forced the Germans to change to low altitude level flight actions. English industrial establishments, airdromes, army encampments and commercial shipping, are targets for these attacks.

The German attack aviation tactics over England have their special features. The approach to targets is made at medium altitudes. At some distance from the target the planes change to low level flight, flying over the target at maximum speed. The departure from the target is accomplished at low level flight, after which the craft continue on their way at medium altitudes, using clouds for cover.

Instances have been observed wherein attacks upon strongly defended objects were accomplished at night. The German command holds the view that searchlights cannot disclose a low-flying plane, hence losses are small while the effectiveness of hits is increased.

According to German experiences, the twin-motored pursuit plane Messerschmitt-110 and the twin-motored bomber Dornier-215, are the most suitable types of craft for this purpose. The former type is armed with two cannons and four machine guns for direct fire, and develops a speed of about 355 miles per hour. The latter plane has a speed of up to about 310 miles per hour. There are several types of the "Dornier;" the type used for attack apparently has additional armament.

TANK ACTION IN THE ZONE OF APPROACH.
[Deystvya tankov v predpolye.] Colonel P. Rotmistrov

3 December 1940

THE INFANTRY REGIMENT IN ATTACK ON THE MAGINOT LINE.
[Pekhotniy polk pri atakye linii Mazhino.] B. Ivanov

The action took place in the vicinity of Zieming. Here, along a front of one kilometer, there was a concentration of 40 reinforced concrete fortifications.

On 26 June, the German 339th Infantry Regiment, which has just completed a 25-mile march, received the order to capture three heavily fortified hills within the following 24 hours. The key to the defensive system was hill 240, on which the French in 1932 had constructed a powerful fort, consisting of the principle structure and connected by subterranean galleries with separate armored turrets. At a distance of some 2 kilometers the second and third forts were situated, but these had a lesser number of subsidiary fortifications. All of the permanent pill boxes of these forts were equipped with artillery of various calibers, up to 75-mm, and machine guns. All this was well suited to the terrain. All these centers of resistence—forts—had established an exchange of fire information, and were protected by 6 rows of barbed wire barrier. All of the approaches were mined, although there were no special antitank obstacles. The terrain was especially suited to defensive action. The garrisons of these fortifications consisted mainly of reservists, led by reserve officers.

The advancing German regiment, protected by heavy artillery fire, moved up closely to the fortified hills. The first battalion was given the mission of capturing the fortifications on hills 230 and 240. The battalion machine-gun company was distributed between the 1st and 3d Companies, forming the first echelon. The battalion was supported by an antitank artillery battalion and 2 antiaircraft guns (88-mm). The attack began at 9:00 PM, after one hour's artillery preparation. After a short engagement the fortifications on hill 230 had surrendered, in spite of help from the neighboring forts which had opened the heaviest artillery and machine-gun fire on the approaches to this hill.

The Germans failed to capture the fortifications on hill 240 the same day, whereupon the battalion commander decided to accomplish this on the morning of 27 June. All of the artillery added to the battalion was concentrated within 150 to 200 meters from the main structure of the fort. This concentration included 15 antitank 47-mm guns, and 2 antiaircraft 88-mm guns.

The artillery preparation continued 2 hours, in the course of which the machine-gun turrets, defending the approaches to the main structure, were put out of action. Ventilation was also damaged. After this, a company led by the battalion commander, advancing through woods emerged in the rear of the main structure, making use of the French communication trenches. Soon thereafter the garrison of the fort, numbering 150 men, surrendered.

In capturing permanent fortifications of the Maginot Line, the Germans skillfully took advantage of their structural faults, such as concentration of all electric power installations in one place. Thus, the disabling of the main structure deprived all the other fortifications of light, air and water, compelling them to give up further resistance. Furthermore, it must be noted that the main structures were vulnerable from the rear.

This same regiment also employed other methods in capturing other permanent fortifications. For instance, gasoline and flame throwers were used. The gasoline was poured through openings into permanent fortification, and then ignited by a blank shot or a match. Portable flame throwers also were used, and the flame stream was directed into the embrasures.

The pioneers played the decisive role. Very frequently small groups of pioneers (10-15 men, commanded by an officer or a noncommissioned officer), would crawl at night up to the permanent fortification, and by placing an explosive charge or a bundle of hand grenades on the armored parts of the fortification, would blast its most vital portions.

No counterattacks from the fortifications were undertaken by the French.

7 December 1940

GERMAN AND BRITISH PURSUIT AVIATION.
[Germanskaya i Angliyskaya Istrebitelnaya Avyatsya.]
Army Engineer Tuchin

The quality of German pursuit aviation has improved greatly within the past three years. As recently as the early part of 1937 the German air force was equipped with such obsolete types as the Heinkel He-51 and the Arado A-68, both single-seaters. The maximum speed of the former—and it was the better of the two types—did not exceed about 200 miles per hour.

At present, the German air arm is equipped with fully modern pursuit craft, the single-motored, two-seater Messerschmitt Me-109, Heinkel He-113, and Messerschmitt Me-110. These highly modern planes are powerfully armed with machine guns and cannon. They are highly maneuverable, have a wide radius of action, are easily handled in the air, and have improved facilities for the personnel.

Messerschmitt Me-109.—A prototype of this craft first made its appearance at the international air races in Zurich, in July 1937. The early series of planes of this type was equipped with the Junkers JMO-210 motors, of 640 HP. These planes were widely employed in Spain. At present, the Me-109 is equipped with the Daimler-Benz DB-600 motor, of 1050 HP.

The maximum speed of this ship at altitude of 5,000 meters—570 kilometers (about 350 miles) per hour, cruising speed, 300 miles per hour. Practical ceiling— 11,000 meters, range of flight, up to about 625 miles, rising speed—5,000 meters in 4.9 minutes. The craft weighs 2,010 kilograms, weight in flight—2,540 kilograms. Two synchronized 7.92-mm machine guns are installed in the bow of the fuselage. Each of the wings carries two 7.92-mm machine guns. In addition to this, facilities are available for installing a 20-mm gun on the motor.

Heinkel HE-113.—This single-motor type was accepted by the German air force in 1940. At an altitude of 5,000 meters, it has a speed of about 420 miles per hour, its cruising speed at altitude of 4,500 meters is 510 kilometers (about 318 miles) per hour, practical ceiling—10,000 meters, effective range—about 520 miles; it rises to altitude of 6,000 meters within 6 minutes. The plane weighs 2,070 kilograms, weight in flight—2,500 kilograms. Its arament consists of an Oerlikon FF gun installed on the motor, and firing through the nave of the propeller; and two 13-mm synchronized machine guns. Instead of the gun, an MG-17 machine gun can be installed.

Messerschmitt Me-110.—In addition to the single-seater pursuit craft, the German air force also has the two-seat Messerschmitt Me-110. This type was built in 1938 and was adopted during the latter part of 1939. It has two DB-600 motors, of 2,300 HP. This plane has a wide radius of action and is being widely utilized for convoy and patrol duty. It can also be employed as a light bomber, fighter, and for long distance reconnaissance. The crew of this ship consists of a pilot and a gunner, and when it is employed as a bomber, fighter or for reconnaissance, a navigator is added to the crew. The ME-110 has a speed of about 235 miles per hour at altitude of 5,000 meters, landing speed about 80 miles per hour, practical ceiling 10,500 meters, range of flight—1,400 kilometers. Within 7.5 minutes it rises to an altitude of 5,000 meters. It weighs 4,200 kilograms and can carry a load of 2,200 kilograms. The ME-110 is speedy, highly maneuverable and its armament is concentrated. The latter consists of four stationary machine guns in the bow, and two cannons under the fuselage. In addition to these, in the gunner's pit is a double-turret machine gun. There is a two-way radio and oxygen apparatus.

* * * * * * *

The British air force is equipped with the latest types of Supermarine "Spitfire" and the Hawker "Hurricane" pursuit craft.

Supermarine "Spitfire".—The single-seat, single motor Supermarine "Spitfire" pursuit plane is equipped with a Rolls-Royce "Merlin" water-cooled motor, of 1,050 HP.

Maximum speed of the "Spitfire" at an altitude of 5,000 meters is about 365 miles per hour, cruising speed—520 kilometers per hour, effective range—880 kilometers, it rises to an altitude of 3,800 meters within 4.8 minutes. Flying weight—2,600 kilograms. Armament and equipment: 8 Browning machine guns caliber 7.62-mm, four in each wing. This plane has instruments and apparatus for night and blind flying.

Hawker "Hurricane".—This single-seat, single-motor pursuit craft is equipped with the same Rolls-Royce motor as the "Spitfire." The maximum speed of the "Hurricane" at an altitude of 5,600 meters (about 365 miles) per hour, cruising speed, about 300 miles per hour. Practical ceiling, 11,900 meters, effective range, 880 kilometers (about 550 miles), ascent to 6,000 meters within 9.5 minutes. The ship weighs 2,220 kilograms, flying weight, 2,720 kilograms. It is equipped and armed identically as the "Spitfire".

The British air force is equipped only with single-seater pursuit planes, and their effective range is relatively small. There are no two-seater pursuit in England. The absence of twin-motored pursuit craft with a high effective range, renders difficult the daytime employment of bombardment aviation against objects, deep in the enemy rear.

Although the Supermarine "Spitfire" is faster than German pursuit craft, it is also less maneuverable. The "Hurricane" is more maneuverable but slower.

9 December 1940

NIGHT RAID.
[Nochnoy Poisk.] Captain P. Kovantsev

During action on the Finnish front, small raiding parties did important work. Protected by darkness or inclement weather these parties approached enemy fortifications not only to capture prisoners to extract valuable information from them, but they also frequently accomplished important missions. More than once a raiding party succeded in bringing back valuable information on enemy strength and disposition, as well as on the situation of his antitank and anti-infantry obstacles, and the nature of his permanent fortifications.

Night reconnaissance can never be standardized—the Finnish war has proved this. Every change in the general situation brings changes in the methods of each individual reconnaissance. The commander must be vigilant to adjust himself to the ever-changing picture of battle.

On 5 January 1940, at sunset, a Soviet observer noticed that the Finns placed an OP at the edge of the woods, to the southeast of Hill 655. Upon learning this, the Soviet company commander decided to capture the two Finnish soldiers at the OP. At about 1:00 AM a raiding party was sent out, consisting of the company commander, the company political instructor and three soldiers. The party was supported by a rifle platoon, which took up position in brushwood at a distance of some 300-400 meters.

The night was cold, the snow was deep everywhere. The men moved forward slowly but surely. Four hours later at the edge of the woods, a dark spot was observed at 50-60 meters. The party continued to advance by crawling. When only a few meters from the dark spot a shot was heard, which missed its mark but served to reveal that the dark spot was a Finnish soldier. Thereupon the company commander tossed an unloaded hand grenade at the Finn, and while the latter squatted in his skirmish trench, waiting for the explosion, he was beset by two of the Russians who promptly gagged him, tied his hands, and proceeded to pull the prisoner into the brushwood. Meanwhile the Finns opened fire against the party, but to no avail, since the mission was accomplished. The prisoner was the noncommissioned officer in command of the field OP.

Worthy of special attention in this exploit was the resourcefulness of the company commander in tossing the hand grenade when he did. Had he hesitated but a few seconds, the mission would have failed.

Frequently there are instances when the mission can be accomplished only by penetrating the enemy position. In such case, of course, it will be advisable to employ large raiding parties, reinforced by pioneers. The following illustrates this:

Report was received from a Soviet OP that every morning and evening a group of 3 to 5 Finns runs to the rear from a fortification in the Summa sector, through a communication trench, returning the the same way. The Soviet commander decided to go around the fortification at night, in order to capture a prisoner and to learn about the nature and strength of the fortification (later disclosed as one of the principle fortifications of the Summa sector). On the night of 13 January a party of 22 men led by the company commander, set out on a raid. For two days prior to the raid, the company commander had observed the object of reconnaissance and the activity around the fortification. He led his men with all assurance and decision. One half of the party were pioneers and the party was supported by two infantry platoons in concealed positions at a distance of 300-400 meters.

At 4:00 AM the party approached the fortification from the rear and descended into the communication trench. The fortification had two doors, of which the first had ben demolished by Soviet artillery, and the second was intact. Half an hour later, at the very moment when the Soviet commander was busy making a sketch of the fortification, the second door opened and two Finnish soldiers appeared. One of the Russians, who was hiding in the ruins of the first door, waited until the first of the two Finns reached him, and then struck this Finn slightly in the right shoulder with a bayonet. The Finn uttered a few unintelligible words and fell. The second Finnish soldier fired his rifle and ran back, slamming the door. Two or three minutes later the adjacent pill boxes, which apparently were warned by the second Finn by telephone, fired several flares and opened heavy machine-gun fire. All this, however, was without avail. Making use of covered paths, the party, which had now dispersed, returned to Soviet lines without suffering any losses.

An hour and a half later the prisoner was brought to headquarters. He stated that he was captured while en route to relieve a field post located some 150-200 meters to the front of the fortification. This information, together with the sketch made by the company commander, served to good purpose.

It is readily evident that the success of this raid was due entirely to the diligence of the company commander in his careful, two-day study of the terrain of action.

Inasmuch as the success or failure of reconnaissance depends entirely on the concealment of movement of personnel, special attention must be paid to clothing, armament and equipment. All extra articles must be left behind. Short coats should be worn, especially when on skis. The rifle may be cumbersome. When crawling, therefore, the soldier should be equipped with an automatic, hand grenades and trench knife. Each man should have a map on which the situation is not to appear; also a compass and a watch.

While a dark night is conducive to successful reconnaissance, darkness alone should not be the only factor. Weather, too is most important. On the Finnish front best reconnaissance work was accomplished during snowfall, in fog or blizzard.

COMBAT AT CLOSE QUARTERS.
[Blizhniy Boy.] From the German periodical "Truppendienst".

The use of rifle and bayonet in hand-to-hand combat.

13 December 1940

TRAINING FOR COMBAT AT CLOSE QUARTERS.
[Shkola blizhnyevo boya.] (I) From the German periodical "Truppendienst".

The German training curriculm for combat at close quarters consists of snap and hip firing, the bayonet thrust and defense against same; the blow by rifle butt and defense against same; fighting with the hand grenade, shovel and trench knife; combat without arms; the penetration of defensive zone, small raiding parties; action against tanks.

Several training problems are given in the various methods of close combat.

ESCAPE FROM ENCIRCLEMENT.
[Vykhod iz okruzhenya.] Major General M. Knyazey

Escape from encirclement can be successfully accomplished if: (1) It is possible to find weak spots in the enemy ring and to direct appropriate blows against them; (2) The method of escape from encirclement is coordination with the measures of the higher commander and neighboring assisting friendly forces; (3) Sufficient forces and means are concentrated in the sector of the breakthrough, and the cooperation of various arms is organized; (4) Simultaneously with the breakthrough, appropriate forces hold the space on the flanks and in the rear of the force accomplishing the operation; (5) Finally, if the enemy is misled as to the time and place of the breakthrough attempt.

The author quotes several historical examples, particularly the operation of the Schaeffer group, encircled by the Russians in the battle of Lodz, in 1914.

14 December 1940

TRAINING FOR COMBAT AT CLOSE QUARTERS.
[Shkola blizhnyevo boya.] (Conclusion) From the German periodical "Truppendienst".

15 December 1940

MOUNTAIN ARTILLERY IN FOREST COMBAT.
[Gornaya artillerya v lyesnom boyu.] Lieutenant E. Sviridiov

Action in the forest, where there is lack of roads, limits the maneuverability of artillery, while not reducing the requirements for speed in deployment. This brings about the need for artillery matériel of special type. Experience in Finland has served to show that the mountain gun and the mountain pack gun, lend themselves to forest terrain.

17 December 1940

THE ADVANCE OF A GERMAN INFANTRY REGIMENT ON DUNKIRK.
[Nastuplenye germanskovo pekhotnovo polka na Dyunkerk.] B. Ivanov

The battle for Dunkirk was approaching end. On land the city was defended by old and partially modernized forts. In addition to these, field fortifications were built, for which the hilly terrain was utilized to advantage. Dunkirk and its approaches were defended by a French infantry division, numbering some 18,000 men. These French forces were very tired through participation in previous action.

On 3 June, the day before its fall, Dunkirk was intensively bombed from the air. A total of 80 aircraft took part in the bombing, returning 24 times to unload their bombs. Following this, at 2:00 PM, the artillery preparation began.

The battle for Dunkirk began on the night of 3-4 June. The German division advanced in three echelons. The first echelon was strongly reinforced by artillery (two artillery regiments to each infantry regiment). The defense cracked under the heavy artillery fire and aerial bombardment.

Soon after this, one infantry battalion succeeded in breaking into the city. The regiment to which this battalion belonged, was advancing in the first echelon of the division on an 800 meter front. The attacking forces suffered some casualties from the fire of French armored cars, equipped with small caliber artillery and machine guns. Also the Allied naval units, anchored at Dunkirk, were firing on the Germans.

When the German regiment broke through, the city's garrison capitulated. However, in the coastal area the battle continued until noon.

The second echelons did not have to be brought into the engagement. According to German sources, the regiment which had accomplished the mission lost 50 men killed and 30 to 40 wounded. The French casualties totalled 500 men, killed and wounded. Of the 10,000 civilian population, 2,000 were killed.

MARINE CORPS GAZETTE

March 1941

MODERN CAMOUFLAGE. Captain P. Rodyenko, C of E-Reserve
ISLAND DEFENSE. Lieutenant R. A. McGill
LIGHTWEIGHT ASSAULT TROOPS. Captain A. L. Bowser, Jr.
A REVIEW OF CAMOUFLAGE LITERATURE. (II) Lieut. Colonel W. P. T. Hill
AN ANALYSIS OF THE CROSSING OF THE MEUSE RIVER BY 2D DIVISION A.E.F. ON 10-11 NOVEMBER, 1918. Lieut. Colonel D. L. S. Brewster
HILTON HEAD AND PORT ROYAL, 1861. Lieutenant R. D. Heinl, Jr.
AS IT WAS BEFORE. (IN 1917-1918) J. C. Jenkins
A CRITIQUE OF RESERVE TRAINING. Captain Ben Stern, U.S.M.C.R.
WHO SUNK THE HAMPSHIRE? TWENTY-FIVE YEARS AGO THE ARMORED CRUISER MYSTERIOUSLY DISAPPEARED. H. S. Mazet, U.S.M.C.R. (A.O.)

MILITÄRWISSENSCHAFTLICHE MITTEILUNGEN (Austria)

BY CAPTAIN O. C. MICHELMANN, Military Intelligence

January 1941

SEA WARFARE TODAY.
[Der Seekrieg gestern und heute.] Captain v.Handel-Mazzetti, German Navy

This article describes various theaters of sea operations, developed since World War I. The British Isles are in effect no longer insular, in relation to the continent, he asserts.

February 1941

CONTEMPORARY DEFENSE SKETCHES: DAKAR.
[Wehrpolitische Skizzen zum Zeitgeschehen.] Colonel Mlaker

The author prefaces his article with a statement that from 23 to 25 September (1940) English naval vessels attempted to take over the French naval base at Dakar but the French ships there thwarted five attempts at landing. The article itself is a vivid description of the harbor and of its significance as a port, both for sea and air.

A SIMPLE, GRAPHIC METHOD OF SOLVING A SOUND-RANGE PROBLEM IN CASES WHERE LISTENING POSTS ARE IN STRAIGHT LINE.
[Ein einfaches konstruktives Verfahren zur Lösung der Schallmessaufgabe für den Fall, dass die Horchstellen in einer Geraden liegen.] Dr. Groeneveld

In algebraic formulae, this article purports to offer a much simpler solution to what has been regarded a difficult problem.

March 1941

ENGLAND'S PREPAREDNESS POTENTIALITY AT THE OUTBREAK OF WAR IN 1939.
[Englands rüstungswirtschaftliches Potential bei Kriegsausbruch 1939.] Field Marshal Pflug

The financial, industrial, raw materials and military and civilian relief problems are discussed at length in this article. Comparisons are made with the situation in 1914.

MILITÄRWISSENSCHAFTLICHE RUNDSCHAU (Germany)

BY MR. LAVERGNE DALE, C&GSS Library

January 1941

MONOGRAPHS OF THE WAR ON THE WESTERN FRONT.
[Einzelschilderungen aus dem Kriege an der Westfront.] (II)
Rotterdam capitulates on 14 May.

The 3d Battalion, 4th Rifle Regiment, forces a passage over the Meuse at Monthermé on 13 May.

Motorcycle riflemen forward! Pursuit from the Meuse at Monthermé to Montcornet by the 1st Company, 6th Battalion Motorcycle Riflemen.

The 4th Battery of the 103d Artillery Regiment in the Mormal Woods on 20 May.

The forest fight of the 118th Infantry Regiment on 23 May, in the Bois de Sommauthe.

The 2d Company, 31st Infantry, at Tannay on 24 May.

The storming of the fortress of Bergues in front of Dunkirk on 2 June.

The 1st Company, 12th Rifle Regiment breaks through the enemy's fortified lines south of Peronne on 5 June.
The drive on Blangy by the reconnaissance detachment of the 46th Division on 6 June.
Around Hill 304! (14 km. northwest of Verdun.)
The attack of the 203d Infantry Regiment against Toul on 19 June.
The attack across the Rhine on 15 June.
The crossing of the Rhine by the 2d Battalion, 444th Infantry, from 15 to 18 June.
Engineers on the Upper Rhine.

MILITÄR-WOCHENBLATT (Germany)

By Captain O. C. Michelmann, Military Intelligence

7 February 1941

Recruitment.
[Unser Ersatzwesen.] Captain Delbrück

14 February 1941

Technical considerations for the command regarding the employment of the army construction troops in an advance.
[Führungstechnische Gesichtspunkte für den Einsatz der Heeresbautruppe beim Vormarsch.]
(See Digest, page 87.)

21 February 1941

The new Swiss infantry drill regulations.
[Die neue schweizerische Ausbildungsvorschrift für die Infanterie.]

28 February 1941

The Blitzkrieg in France.
[Der Blitzkrieg in Frankreich.] Lieut. Colonel Gaul
Extracts from a report of the French General Staff.

7 March 1941

German soldiery. Our company attacks Calais.
[Deutsches Soldatentum. Unsere kompanie stürmt Calais.] Sergeant Major Hermann Schulze
A realistic, detailed account of this battle as related by a soldier of the 7th Company, 69th Infantry.

14 March 1941

Greece—bridge to the Orient.
[Griechenland—Brücke zum Orient.]
This article states that Greece is at the focus of political developments where several lines of force intersect one another and appears predestined as the pivotal point of military operations.

Marvels of organization in the 1914 and 1939 mobilizations.
[Die Organisationswunder der Mobilmachung 1914 und 1939.] Major K. Berger
In this article the author states that "the modern, scientific and mechanized war, which must be conducted in military, economic and propagandized manner, has given warfare new meaning."

28 March 1941

German soldiery. A reconnaissance detachment at Liége.
[Deutsches Soldatentum. Eine Aufklärungsabteilung in Lüttich.]
This article (with map) is based upon battle reports from Lieutenants Voss and Wirth, as compiled by Captain Brett, German Army.

4 April 1941

A Finnish army corps commander describes the Finnish-Russian War.
[Ein finnischer Armeeführer über den Finnisch-Russischen Krieg.] Friedrich Ege
General Öbquist, Finnish Army Corps commander, is the author's source of information. He describes the Finnish soldier's psychic strength in repelling attacks, the part played by planes and tanks, and the role of the artillery. He concludes with a statement on lessons to be learned from this war.

Oil requirements and distribution.
[Erdölbedarf und Erdölverteilung.] Dr. Paul Ruprecht
A detailed account of the world's oil resources. The author declares that the United States and Russia are alone among world powers in having sufficient oil to meet requirements.

MILITARY ENGINEER

March-April 1941

Assault of a fortified position. Captain William Whipple
Field training in engineer operations. Captain Alvin B. Auerbach
Malta—Crossroads of the Mediterranean. Major Ernest W. Steel
Training a selectee to be an engineer soldier. Captain Ralph S. Johansen
Fort Leonard Wood, Missouri. Lieut. Colonel Fred W. Herman
Peru. Colonel E. J. Ristedt
Engineers in battle. Captain Paul W. Thompson
Engineer Board notes: Research in camouflage and concealment facilities.
Great Lakes ports and waterways. Lieut. Colonel N. Y. Du Hamel
New engineer units. Major Colby M. Myers
An all-purpose camouflage net. Captain Peter Rodyenko

MILITARY SURGEON

March 1941

Physiological and psychological characteristics of successful pilots. Colonel A. D. Tuttle
Airplane ambulance evacuation. Lieut. Colonel David N. W. Grant
So-called "shell shock": types, etiological factors and means for its prevention. Crawford N. Baganz, M.D., and Lieut. Colonel Charles M. Strotz, Medical Reserve

April 1941

A visit to the German Army Medical Service in 1937. Lieut. Colonel E. E. Hume
Gunshot wounds. J. J. Gunter
Surgical technique in modern battle. Gustavus M. Blech, M.D., LL.D.
Mechanized evacuation within the combat regiment. Captain C. R. Darnall
The diary of Assistant Surgeon Leonard McPhail on his journey to the Southwest in 1835. Colonel H. W. Jones

May 1941

The medical service at the First Army maneuvers of 1940 with special reference to the work of the first evacuation hospital. Colonel J. L. Kantor
A proposal for the training of officers of the Medical Department Reserve Corps, U.S. Army, assigned to the laboratory service, both upon active and inactive status. Lieut. Colonel A. G. Hulett
Military psychiatry. Lieutenant J. A. Brussel

NAVAL INSTITUTE PROCEEDINGS

February 1941

Future cruisers. Lieutenant F. G. Percival, U. S. Navy, Retired
Blockaders off the American coast. Carlos C. Hanks
Big Bertha, 1855 style. Willy Ley
The survival of the British Empire: 1792-1812, 1914-1940. J. M. Scammell

March 1941

The death of a fleet. Ensign J. B. Brown

April 1941

American sea power—1941 and beyond. (Honorable Mention, 1941) David W. Kendall
Motion pictures in naval training—an overlooked essential. Lieutenant Commander S. G. Kelly
Modern submarine versus major warship. Lieutenant S. D. Willingham
And now—naval R.O.T.C. students become ensigns of the line. Lieutenant Commander F. J. Nelson

May 1941

A beginner's outline of strategy and tactics. Lieut. Commander R. T. Strong
Brazil. Rear Admiral A. T. Beauregard

PROPHET OF THE BLITZKRIEG. Donn Glassman
LET'S TRY A NEW WEAPON. Lieutenant F. D. Buckley
THE PERSISTENCE OF THE EGYPTIAN FACTOR IN MEDITERRANEAN STRATEGY. Lieut. Commander C. Moran

DIE PANZERTRUPPE (Germany)

BY CAPTAIN O. C. MICHELMANN, Military Intelligence

January 1941

DRIVING TANKS ON ROADS.
[Fahren mit Panzerkampfwagen auf Strassen.]

In this article it is stated that the tank is essentially a cross-country vehicle. The author discusses at length, however, how best to use tanks on paved roads, considering traction, slopes, weights and speeds. He would generally set a maximum speed of about 15 miles per hour on tanks, depending upon traffic conditions and the mission, with greater speeds only when circumstances actually require it.

STARTING (MOTORS) IN COLD WEATHER.
[Starten bei Kälte.] (I) Ludwig Strunz, Engineer

The article offers practical suggestions to field troops to enable them to overcome common difficulties in starting motors due to freezing temperatures.

TRANSPORTATION DEVELOPMENT IN THE NEAR EAST (TURKEY).
[Die Verkehrsentwicklung im vorderasiatischen Raum (Turkei).] W. Paschasius

This article discusses the development of a railroad system in Turkey up to recent years. An accompanying map indicates the locations of various lines and whether they are of standard or small gauge or the Russian wide gauge construction; also lines under construction or contemplated.

February 1941

STARTING (MOTORS) IN COLD WEATHER.
[Starten bei Kälte.] (II) Ludwig Strunz, Engineer

Concluding article on this subject. Thirteen illustrations include some of electrical heating units attached to various parts of different types of motors.

TRANSPORTATION DEVELOPMENT IN THE NEAR EAST (IRAN).
[Die Verkehrsentwicklung im vorderasiatischen Raum (Iran).] W. Paschasius

This is an article similar to the one on Turkey in the January issue.

March 1941

SAFEGUARDS TO PREVENT FREEZING OF AIR-BRAKES.
[Frostschutzmittel verhindern Einfrieren von Druckluftbremsanlagen.]

This is a detailed account of methods employed on motor trucks and trailers to prevent air brakes from freezing. An engineer's drawing depicting an air-brake layout accompanies the article.

GERMAN MOTOR TRANSPORT TROOPS IN IRAQ.
[Deutsche Kraftfahrtruppen im Irak.]

This article describes experiences of German motor transport troops in Iraq in 1918.

QUARTERMASTER REVIEW

March-April 1941

MOTOR REPLACEMENT PARTS. THE ARMY'S SYSTEM OF SUPPLYING THEM. Lieutenant E. P. Hogan
CONSTRUCTION OF DEFENDUM RANGE. Lieut. Colonel J. E. Adamson
A SOLDIER'S CITY ARISES FROM THE DUST. Captain F. E. Brake
THE ARMY "BUG". NEW QUARTER-TON COMMAND RECONNAISSANCE CAR. Lieutenant E. P. Hogan
ACTION IN ATLANTA! ESTABLISHMENT AND DEVELOPMENT OF THE FOURTH CORPS AREA QUARTERMASTER DEPOT. Lieutenant J. R. Strother
MOTOR TRANSPORT AND THE NATIONAL DEFENSE. Brigadier General J. E. Barzynski
SUPPLY TAKES TO THE AIR. THE INFLUENCE OF THE AIRPLANE ON THE LOGISTIC ORGANIZATION OF THE ARMY WITH SPECIAL REFERENCE TO THE COMMISSARY SERVICE. Lieut. Colonel Gustavo Secco, Italian Army
THE QUARTERMASTER PROBLEM. USE OF GOVERNMENT TRANSPORTATION REQUESTS. Major G. M. Grimes

RECRUITING NEWS

March 1941

HIGH COMMANDERS OF THE A. E. F.: Walter Henry Gordon

April 1941

HIGH COMMANDERS OF THE A. E. F.: Joseph Ernst Kuhn
ARMY DAY. OBSERVANCE OF DAY DEDICATED TO MILITARY PREPAREDNESS TO BE WIDELY CELEBRATED

May 1941

HIGH COMMANDERS OF THE A. E. F.: William Weigel

RESERVE OFFICER

April 1941

ARE PARACHUTE TROOPS PRACTICAL? Lieutenant C. O. Kates
15TH INFANTRY SKI-PATROL. Captain H. C. Crawford

May 1941

THE ART OF GENERALSHIP. General Sir Archibald Wavell
THE PUBLIC RELATIONS BUREAU. Major General Robert C. Richardson, Jr.
PRESENT DAY CAMOUFLAGE. Lieut. Colonel Homer Saint-Gaudens

REVISTA MILITAR (Argentina)

BY MR. LAVERGNE DALE, Library, C&GSS

December 1940

METEOROLOGICAL PROBLEMS IN MILITARY AVIATION.
[El problema meteorológico de la aviación militar.] Prof. Juan Jagsich

---

ADVANTAGES OF MOTORIZED MEDICAL UNITS IN THE TRANSPORTATION AND TREATMENT OF THE WOUNDED IN WAR.
[Ventajas de la motorización sanitaria en el transporte y tratemiento del herido de guerra.] Brigade Surgeon Vernengo

---

CONCERNING WIND-DRIFT CORRECTION TABLES IN MACHINE-GUN FIRING.
[Sobre las tablas para corregir la influencia del viento en el tiro de ametralladoras.] Captain P. A. Marreins

---

DETECTORS OF TOXIC GASES.
[Detectores de gases tóxicos.] (I) Lieutenant E. C. Lutteral

FLANKING, ENVELOPING, AND BREAKTHROUGH. A SCHLIEFFEN-TYPE STUDY.
[Envolvimiento, rodeo y ruptura. Un estudio schlieffeano.) (I) Colonel Mantey

---

TACTICAL PROBLEM OF A REINFORCED BATTALION.
[Tema tácticos. Battalón reforzado.] I

January 1941

CAVALRY IN THE RIO DE LA PLATA WARS.
[Las caballerias en las guerras del Rio de la Plata.] General Sarobe

---

THE RECRUITING OF ADMINISTRATIVE PERSONNEL.
[Reclutamiento del personal de Administración.] Lieut. Colonel J. G. Paz

---

COMBAT FIRING INSTRUCTION IN THE INFANTRY.
[La instrucción de tiro de combate en la infanteria.] Major S. M. Blanco

---

THE ETHICS OF ORGANIZATION IN WORKING PLANS.
[Etica de la organización en los planes de trabajo.] Major D. P. R. Dominguez

The necessity of systematic and orderly efforts in accomplishing tasks.

A FEW LESSONS FROM RECENT WARS.
[Algunas ensenanzas de guerras recientes.] Major A. G. Fernandez

---

DETECTORS OF TOXIC GASSES.
[Detectores de gases toxicos.] (II) Lieutenant E. C. Lutteral

---

REGARDING THE PROJECT FOR THE FORMATION OF 5,000 CIVILIAN PILOTS FOR THE AERIAL RESERVES.
[A propósito del proyecto de formación de 5000 pilotos civiles para las reservas aéreas.] Lieutenant J. R. Bustamante

---

TELEPHONE COMMUNICATIONS IN THE BATTLE OF TANNENBERG.
[Las comunicaciones telefónicas en la batalla de Tannenberg.] (Translation)

ENVELOPMENT, TURNING MOVEMENT, AND BREAKTHROUGH. A SCHLIEFFEN-TYPE STUDY.
[Envolvimiento, rodeo y ruptura. Un estudio schlieffeneano.] (II) Colonel Mantey

---

THE ARMAMENT OF SINGLE-PLACED (PLANES).
[El armamento de los monoplazas.]

Since the Spitfires and Hurricane planes are of the above class, the above single-placed (planes) can hardly mean single-seaters.

February 1941

A FEW WORDS TO YOUNG OFFICERS.
[Algunas palabras a los jóvenes Oficiales.] General Abel Miranda

---

EXPEDITIONARY FORCES IN THE DESERT.
[Expedicionarios al Desierto.]

THE PROBLEM OF TUBERCULOSIS IN OUR ARMY.
[El problema de la tuberculosis en nuestro Ejército.] Drs. Santiago and Curci

---

GERMAN WIRELESS COMMUNICATIONS IN THE BATTLE OF TANNENBERG.
[Communicaciones inalámbricas alemanas en la batalla de Tannenberg.] Captain Noblia

---

CONCERNING THE TRAJECTORY OF BOMBS.
[Sobre la trayectoria relativa de las bombas.] Captain Marreins

---

THE SUPPLYING OF MUNITIONS IN THE ARTILLERY REGIMENT.
[Abastecimiento de munición en el regimento de artilleria.] Lieutenant Galindez

---

TACTICAL PROBLEM OF A REINFORCED BATTALION.
[Tema tactico. Batallón reforzado.] (II)

THE INVISIBLE BRIDGE OVER THE MEUSE AT ST. MIHIEL, 1918.
[El puente invisible sobre el Mosa, en St. Mihiel, en 1918.]

March 1941

IMPORTANCE OF RAILROADS. RAILWAY TROOP UNITS.
[Importancia de los ferrocarriles. Unidades de ferrocarrileros.] Brigaider General Giovaneli

---

CONSERVATION OF AERONAUTIC MATERIALS. SIGNIFICANCE AND IMPORTANCE OF THE KEEPING OF EQUIPMENT IN ORDER.
[Conservation de los materiales aeronáuticos. Significado e importancia del mantenimiento.] Major Dominguez

---

A FEW CONSIDERATIONS REGARDING THE EMPLOYMENT OF THE PERMANENT MEANS OF COMMUNICATION DURING THE BATTLE OF TANNENBERG.
[Algunas consideraciones sobre el empleo de las communicaciones permanentes en la batalla de Tannenberg.] Captain Noblia

---

KNOCK-DOWN METALLIC BRIDGES.
[Puentes metálicos desmontables.] Lieutenant Vargas

INDIVIDUAL INSTRUCTION IN HIGH-ALTITUDE BOMBING.
[La instrucción individual de bombardeo de altura.] Lieutenant Alsogaray

REVUE MILITAIRE SUISSE (Switzerland)

January 1941

STUDIES OF THE POLISH CAMPAIGN.
[En lisant quelques études sur la campagne de Pologne.] Colonel E. M. G. Montfort.

THE WAR OF ENCOUNTER.
[Le combat de recontre.] Captain E. M. G. A. Ernst

Is a meeting engagement feasible for us in the light of current military experience? Daylight marches made by whole divisions are, in my opinion, extremely dangerous as long as the enemy is master of the air. The Germans could undertake such marches because they were able to protect their columns, from the beginning of hostilities, by the use of a powerful air force. That was the case in Poland, in Belgium, and in France. We, however, are unable to do this.

We might perhaps, under certain conditions, far from the enemy, succeed in using roads for troop movements during the day. The enemy aircraft cannot be everywhere. But if we march upon the enemy to attack him—which is the aim of a war of encounter—we can be sure that his pilots will discover us and attack us before we have reached even his first outposts.

Thus, aerial attack is absolutely certain. It is easy to visualize its effect on a battalion marching in column formation, encumbered by more than a hundred horses. Even a considerable addition of the means of the antiaircraft defense would not suffice to protect it. The French, despite being relatively well supplied with antiaircraft guns of high and medium caliber, were unable to ward off enemy air attacks during their movements. How should we be able to?

The enemy, upon whom we are marching for the purpose of joining in a meeting engagement, will certainly not wait for us to attack. He will use to the utmost each opportunity to push forward. These opportunities will present themselves whenever our concentration is incomplete, or when a breakthrough occurs at the front. The forces engaged will certainly not be the cavalry, the infantry, and the cyclists. The attack will be executed by armored and motorized divisions which will attempt to penetrate as deeply as possible into our country, utilizing to the utmost their shock power and speed. To fall upon an enemy who is unprepared for battle is the classical task of rapid formations. Whenever a solid front is formed, the chances of the armored troops diminish. Therefore they use every opportunity to maneuver. By marching to meet them instead of waiting for them, solidly entrenched behind a continuous obstacle, we render them a great service.

We are not going to meet simply a few isolated reconnaissance tanks. We shall be assailed by hundreds of armored weapons, from light to heavy tanks. It will very probably not be a frontal attack, nor will it take place on the road. All this motorized equipment will avail themselves of cover and will attack us before we have even had time to place our infantry guns in position. Splitting the advance guard battalion into a screen of patrols will be of practically no use.

At any place where enemy planes or tanks can intervene, an approach march or an attack undertaken by marching troops is automatically excluded. In difficult terrain, such as very dense forests or mountains, one might be able to pass directly from the march to the attack. Such situations are, however, also governed by other principles.

The likelihood of a meeting engagement being uncertain, it is not worth while to continue very rigorous practice of this form of combat. We ought not recommence the mistakes made in time of peace, and practice war games which are incompatible with actuality.

To this argument we must add one of strategy: For us, a war of movement is impossible.

True, encounters with the enemy might take place without our desiring them. Our front could be broken while reinforcements were on their way to the front lines. Yet, even in that situation, one must do his utmost to avoid a war of encounter. If the enemy has succeeded in making a breach in our lines, he will follow up his success at once by having armored and motorized formations penetrate this gap. Against such an enemy we cannot engage in an engagement of encounter. As soon as a break occurs in the front, forward movement of reserves should be stopped, and the reserves should install themselves defensively in a location inaccessible to tanks.

If the situation is so critical that a penetration by tanks is to be expected, the only thing to do is to send ahead motorized units heavily equipped with antitank guns. These groups will install themselves defensively behind terrain obstacles thus covering the march of the reserves toward the menaced front.

At night, the exploitation of a breakthrough by armored forces is difficult, and this fact notably diminishes the danger of an encounter. In the framework of our national defense, there is thus no circumstance which forces us to accept a more or less improvised meeting engagement.

It seems, however, that the German successes have augmented, even here, the prestige of the war of encounter. In my opinion, the partisans of a war of movement in the framework of our national defense forget the following elements:

(1) True, the Germans have obtained their successive victories thanks to a war of movement. But they were very careful not to practice their "meeting engagement" with patrols of cyclists or infantry. For this purpose they have used armored and motorized formations, supported by a powerful air force. Thus they were able to vanquish an adversary who had nothing of this sort with which to oppose them. We must be careful not to try "German tactics" with our limited means. We can't give tasks to our infantry which only armored forces and aviation are able to do.

(2) In France, it was not the principle of defense which failed, but the belief that defensive combat in a fortified position demands less courage and strength than the offensive.

Active defense is, and remains, the strongest form of warfare. We should be wrong, therefore, to allow ourselves to be influenced by the French defeat. By entrenching ourselves solidly in a well organized position, we shall better resist the attacks of tanks and planes than by offering ourselves to them in the course of maneuvers without protection.

For our army, exercises in a war movement will be excluded as long as we do not have a strong air fleet and armored formations.

The offensive spirit, a characteristic of a war of movement, should not, however, be neglected. We need it constantly, since defense should be active.

February 1941

EMIGRATION AND NATIONAL DEFENSE.
[Emigration et défense nationale.] (I) Major de V.

THE USE OF MINE-THROWERS IN THE PRECIPITATION OF AVALANCHES.
[De l'emploi du lance-mines dans de délenchement artificiel des avalanches.] P. Gaberell

---

INFRA-RED RAYS AND THEIR USES.
[Les rayons infra-rouges et leurs applications.] Dr. P. Bolle

I. Historical: Brief summary of important contributions to study of light, from Newton to present time.

II. Theory: Gives the fundamental laws which explain why certain sources of light are rich or poor in infra-red rays. (Highly technical and mathematical.)

III. Uses: (a) Spectroscopy. (b) Astral spectroscopy—permits of discovery and analysis of chemical bodies constituting either the outside of stars, or their atmosphere. (c) Photothermometry. (d) Traffic and navigation—permits planes to find way in fog; stops trains automatically at a signal, etc. (e) Burglar alarms. (f) Aerial photography. Infra-red photographs, even in fog, show every detail of landscape, near or far. Especially good for distance photographs.

IV. Lessons: Reveals camouflage, either by paint or use of trees and bushes. The army should avail itself of all infra-red photographic aids.

ROYAL ENGINEERS JOURNAL (Great Britain)

March 1941

SMALL CHANGE FROM DUNKIRK. Major M. C. A. Henniker
THE GERMAN PASSAGE OF THE DANUBE, 22ND-26TH NOVEMBER, 1916. Brigadier-General Sir J. E. Edmonds
THE ELEMENTS OF HILL ROAD MAKING. Major L. F. R. Kenyon
RIVER TRAINING WORKS. J. L. Harrison
MECHANIZATION OF R. E. UNITS FROM 1914 TO 1937. Various authors
AERODROME CONSTRUCTION FOR BRITISH COMMONWEALTH AIR TRAINING PLAN. J. A. Wilson
ECLIPSE OF A DIVISION. Colonel Cary I. Crockett
SOUTHERN BESSARABIA IN 1856. Major-General E. R. James
THE ENGLISH AT THE SIEGE OF ROUEN IN 1591-2. Colonel F. E. G. Skey

THE TANK (Great Britain)

February 1941

MARK I TANK EXPERIENCES IN FRANCE
THE CAMPAIGN IN GREECE
THE HOME GUARD
THE MIDDLE EASTERN COMMAND

WISSEN UND WEHR (Germany)

BY CAPTAIN O. C. MICHELMANN, Military Intelligence

January 1941

FRENCH RAILROADS IN WAR.
[Die französischen Eisenbahnen im Kriege,] By Wernekke

The author discusses railroad service prior to, during and after the Battle of France. Employment problems, service schedules and various restrictions of traffic are described.

February 1941

LESSONS FROM THE WAR ON THE POLISH SIDE.
[Seelisch-geistige Schwächen der Polen als Ursache ihrer Niederlage. V. Erfahrungen der Kriegstage auf polnischer Seite.]

The writer describes the disappointment due to the failure of Polish and British aircraft to arrive, the panic resulting from German bombing, the misconception in regard German military equipment, the breakdown of the communications system, the civilian mass flight toward the east and the demoralization of the troops.

★

General

ANNALS OF THE AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE

May 1941

The entire May 1941 issue is a survey of current relations between the United States and Japan, with their background and implications, containing many interesting articles, i.e.:

MILITARISM IN JAPAN'S FOREIGN POLICY. Kenneth Colegrove
JAPANESE WAR ECONOMY. Kurt Bloch
JAPAN'S SOUTHWARD ADVANCE—ECONOMIC AND POLITICAL. Jack Shepherd

FOREIGN AFFAIRS

April 1941

GERMAN STRATEGY: 1914 AND 1940. By X
WAR BY RADIO. John B. Whitton

FORTUNE

April 1941

BETHLEHEM STEEL
IN GREATER EAST ASIA
THE NEW CHINA
ATLANTIC CONVOY

May 1941

CAMPS FOR 1,418,000

To build the barracks for our draft army took 400,000 workers, $918 million—and the half-horse, half-alligator toughness of forty-six constructing quartermasters.

HOW AMERICA CAN TAKE THE OFFENSIVE. Edmond Taylor

Against total war the only defense is attack—total attack with emphasis where Hitler puts it, on political and psychological factors.

June 1941

U. S. NAVAL STRATEGY. Fletcher Pratt

Four oceans, not two, make new demands on a United States fleet that was tailor-made to fight a traditional enemy on the frontiers of only one.

HARPERS MAGAZINE

April 1941

THE NAVAL DEFENSE OF AMERICA. SEA POWER TODAY AND THE U. S. NAVY. Hanson W. Baldwin
OUR UNKNOWN PACIFIC ISLANDS. AMERICAN OUTPOST No. 3. C. Hartley Grattan

ILLUSTRATED LONDON NEWS (Great Britain)

28 January 1941

THE SICILIAN STRAITS: The vital channel in the Mediterranean War
THE "STUKAS" RETURN: Tactics and technique used in the dive-bombing attack on a Mediterranean convoy.

22 February 1941

"POSITION" LAND-MINING A ROAD SURFACE FOR DEPTH-CHARGE. (Pictorial)

THE WAR WITH NAZI GERMANY: Invasion considered once more. Cyril Falls

SAVING THE LUFTWAFFE: An inflatable dinghy for defeated airmen.

1 March 1941

BRITAIN'S GREAT BASTION IN THE EAST: Singapore, stubborn obstacle to Japan's ambitious projects in Southern Asia. (Air map)

U. S. STRATEGIC PACIFIC SITES, WHICH ENVELOP JAPAN AT ALL POINTS

THE WAR WITH NAZI GERMANY: The Far East. Cyril Falls

GERMAN INCENDIARY BOMBS: Clockwork and electric types in use.

LIFE

21 April 1941

WAR IN THE BALKANS. The Nazi machine carves its way deep into Yugoslavia and Greece.

THE CAVALRY. Now men on horseback team up with machines.

NATION'S BUSINESS

May 1941

CANADA—WAR—AND THE U.S.A.

FIREMAN! PUT OUT THAT BOMB. Paul W. Kearney

PROCEEDINGS OF THE ACEDEMY OF POLITICAL SCIENCE

May 1941

ARMY DEVELOPMENTS IN PREPAREDNESS. Major General Robert C. Richardson, Jr.

DEFENSE IN TWO OCEANS. George F. Eliot

ROUND TABLE (Great Britain)

December 1940

(Fifth War Number)

THE STRATEGY OF THE WAR. (V)
THE PROBLEM OF FOOD SHORTAGE IN EUROPE
THE HOME GUARD
IRELAND IN THE VORTEX
GREAT BRITAIN
AUSTRALIA
NEW ZEALAND

March 1941

(Sixth War Number)

THE STRATEGY OF THE WAR. (VI)

TIME

12 May 1941

NATIONAL DEFENSE: Strategy

U. S. AIR SERVICES

May 1941

DECOMPRESSING THE PILOT FOR TESTS AT HIGH ALTITUDE. Andrew R. Boone

---

Tomorrow the professional army will move entirely on caterpillar wheels. Every element of troops and services will make its way across mountains and valleys on the appropriate vehicles. Not a man, not a gun, not a shell, not a piece of bread, will be transported in any other way. A large formation, striking camp at daybreak, will be a hundred miles away by night. It will need no more than an hour to come from a distance of ten miles, and across any kind of country, and take up its battle position against the enemy, or to disappear, in breaking off contact, out of range of fire and field-glasses . . . By pursuing this ever-widening path, the stabilization of fronts by picked troops, which warped the last war from the point of view of military art, and, as a consequence, in the subsequent accounts of losses and results, will be avoided.

General Charles de Gaulle, in 1934;
Toward a Professional Army.

Subject Index

LIST OF PERIODICALS INDEXED AND KEY TO ABBREVIATIONS

Aero = Aeroplane (Great Britain)

A Med Bul = Army Medical Bulletin

A Ord = Army Ordnance

A Quar = Army Quarterly (Great Britain)

Cav Jour = Cavalry Journal

Cav Jour [GB] = Cavalry Journal (Great Britain)

CA Jour = Coast Artillery Journal

FA Jour = Field Artillery Journal

Ftg Forc = Fighting Forces (Great Britain)

La France Mil = La France Militaire (France)

Inf Jour = Infantry Journal

Jour Amer Mil Inst = Journal of the American Military Institute

Jour RAMC = Journal of the Royal Army Medical Corps (Great Britain)

Jour R Art = Journal of the Royal Artillery (Great Britain)

Jour RUSI = Journal of the Royal United Service Institution (Great Britain)

Jour USII = Journal of the United Service Institution of India (Great Britain—India)

Kras = Krasnaya Zvyezda (Russia)

MC Gaz = Marine Corps Gazette

Mil Mitt = Militärwissenschaftliche Mitteilungen (Austria)

Mil Rund = Militärwissenschaftliche Rundschau (Germany)

Mil-Woch = Militär–Wochenblatt (Germany)

Mil Eng = Military Engineer

Mil Surg = Military Surgeon

Nav Inst Proc = Naval Institute Proceedings

Panzer = Die Panzertruppe (Germany)

QM Rev = Quartermaster Review

Rec News = Recruiting News

Res Off = Reserve Officer

Rev Mil = Revista Militar (Argentina)

Rev Mil Suisse = Revue Militaire Suisse (Switzerland)

Roy Eng Jour = Royal Engineers Journal (Great Britain)

Tank = The Tank (Great Britain)

Ws & Wr = Wissen und Wehr (Germany)

GENERAL

Annals = Annals of the American Academy of Political and Social Science

For Aff = Foreign Affairs

Fortune = Fortune

Harpers = Harpers Magazine

Ill Lon News = Illustrated London News (Great Britain)

Life = Life

Nation's Bus = Nation's Business

Proc Pol Sci = Proceedings of the Academy of Political Science

Round Table = Round Table (Great Britain)

Time = Time

U.S. Air Services = U.S. Air Services

Jan = January	**Jul** = July
Feb = February	**Aug** = August
Mar = March	**Sep** = September
Apr = April	**Oct** = October
May = May	**Nov** = November
Jun = June	**Dec** = December

A

ADDRESSES

Army Day. (Rec News—Apr 1941)

AIR ARM

Organization and Equipment

Japan's air strength. (Aero—7 Mar 1941)
Aircraft armor. (A Ord—Mar-Apr 1941)
Wings for Santa Barbara. (FA Jour—Apr 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
The new mobility. (Inf Jour—Apr 1941)
German and British pursuit aviation. (Kras—7 Dec 1940)
Physiological and psychological characteristics of successful pilots. (Mil Surg—Mar 1941)
Let's try a new weapon. (Nav Inst Proc—May 1941)
Regarding the project of the formation of 5,000 civilian pilots for the aerial reserves. (Rev Mil—Jan 1941)
The armament of single-placed (planes). (Rev Mil—Jan 1941)
Conservation of aeronautic materials. (Rev Mil—Mar 1941)
Aerodrome construction for British Commonwealth air training plan. (Roy Eng Jour—Mar 1941)
The "Stukas" return. (Ill Lon News — 28 Jan 1941)
Saving the Luftwaffe. (Ill Lon News—22 Feb 1941)
Division in heaven. [See page 10]
Power-dive bombers. [See "Foriegn Military Digests"]
Changes in air tactics. [See "Foreign Military Digests"]

Training Tactics

Independent air action. (Aero—31 Jan 1941)
Try it out. (Aero—31 Jan 1941)
The credit of the Luftwaffe. (Aero—7 Feb 1941)
The war in the air. (Aero—21 Feb 1941)
The growing night offensive. (Aero—7 Mar 1941)
The R.A.F. in the first half of the second year of war. (A Quar—Apr 1941)
The Air War, 1940. (Ftg Forc—Feb 1941)
Air assault on cities. (Inf Jour—Apr 1941)
What happened at Sedan. (Inf Jour—Apr 1941)
Air-landing divisions. (Inf Jour—Apr 1941)
Look aloft! (Inf Jour—Apr 1941)
Army and Air Force co-operation. (Jour RUSI — Nov 1940)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
The influence of air forces on the course of the war. (Jour RUSI — Feb 1941)
Cooperation of antiaircraft artillery with pursuit aviation. (Kras — 12 Sep 1940)
Air infantry. (Kras — 27 Sep 1940)
Attack action by aviation. (Kras — 28 Sep 1940)
Certain conclusions from air force action in the west. (Kras — 22 Oct 1940)
Aviation camouflage. (Kras — 26 Oct 1940)
Attack from level flight. (Kras — 12 Nov 1940)
Attack aviation abroad. (Kras — 29 Nov 1940)
Airplane ambulance evacuation. (Mil Surg — Mar 1941)
Supply takes to the air. (QM Rev — Mar-Apr 1941)
Are parachute troops practical? (Res Off — Apr 1941)
Individual instruction in high-altitude bombing. (Rev Mil—Mar 1941)
The "Stukas" return. (Ill Lon News—28 Jan 1941)
Decompressing the pilot for tests at high altitude. (U.S. Air Services—May 1941)
Division in heaven. [See page 10]
Lessons from World War II. [See page 19]
Cooperation between aviation and artillery in the penetration of a defensive zone. [See "Foreign Military Digests"]
Power-dive bombers. [See "Foreign Miliatry Digests"]
German tactics in their aerial attacks on London. [See "Foreign Military Digests"]
Independent air action. [See "Foreign Military Digests"]
Function of parachutists. [See "Foreign Military Digests"]
Parachute troops. [See "Foreign Military Digests"]
Changes in air tactics. [See "Foreign Military Digests"]

AIR RAID DEFENSE

Fireman! Put out that bomb. (Nation's Bus—May 1941)

AIR WARFARE

Independent air action. (Aero—31 Jan 1941)
Try it out. (Aero—31 Jan 1941)
The war in the air. (Aero—21 Feb 1941)
Surprises in the Mediterranean. (Aero—21 Feb 1941)
The growing night offensive. (Aero—7 Mar 1941)
Aircraft armor. (A Ord—Mar-Apr 1941)
The R.A.F. in the first half of the second year of war. (A Quar—Apr 1941)
Notes on the war in the air. (Ftg Forc—Feb 1941)
The Air War, 1940. (Ftg Forc—Feb 1941)
Notes on the war in the air. (Ftg Forc—Apr 1941)
Air estimates. (Ftg Forc—Apr 1941)
Air assault on cities. (Inf Jour—Apr 1941)
Look aloft! (Inf Jour—Apr 1941)
The first year of the War, 1939–40. (Jour RUSI—Nov 1940)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI—Feb 1941)
The influence of air forces on the course of the war. (Jour RUSI—Feb 1941)
Aerial landing parties and action against them. (Kras—12 Sep 1940)
Attack action by aviation. (Kras—28 Sep 1940)
Certain conclusions from air force action in the west. (Kras —22 Oct 1940)
Security for antiaircraft against aerial attacks. (Kras—23 Oct 1940)
Attack from level flight. (Kras—12 Nov 1940)
Attack aviation abroad. (Kras—29 Nov 1940)
The survival of the British Empire: 1792–1812, 1914–1940. (Nav Inst Proc—Feb 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc—May 1941)
Let's try a new weapon. (Nav Inst Proc—May 1941)
Meteorological problems in military aviation. (Rev Mil — Dec 1940)
The "Stukas" return. (Ill Lon News—28 Jan 1941)
Saving the Luftwaffe. (Ill Lon News—22 Feb 1941)
The strategy of the war. (Round Table—Dec 1940, Mar 1941)
Division in heaven. [See page 10]
Lessons from World War II. [See page 19]
Power-dive bombers. [See "Foreign Military Digests"]
German tactics in their aerial attacks on London. [See "Foreign Military Digests"]
Independent air action. [See "Foreign Military Digests"]
Battleship or aircraft carrier. [See "Foreign Military Digests"]
Function of parachutists. [See "Foreign Military Digests"]
Parachute troops. [See "Foreign Military Digests"]
Changes in air tactics. [See "Foreign Military Digests"]

AMMUNITION

Forging high-explosive shell. (A Ord—Mar-Apr 1941)
Our arms grow strong. (A Ord—May-Jun 1941)
Molotov cocktail. (FA Jour—Apr 1941)
Shrapnel firing. (Kras—23 Nov 1940)

ANTIAIRCRAFT ARTILLERY

Mechanization on the march. (A Ord—Mar-Apr 1941)
Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
The wrong end of the trajectory. (CA Jour—Mar-Apr 1941)
Dry land coast artillery. (CA Jour—Mar-Apr 1941)
Antitank defense. (FA Jour—May 1941)
Our A.A. gunners. (Ftg Forc—Feb 1941)
The toll of our anti-aircraft batteries. (Jour RUSI—Feb 1941)
Cooperation of antiaircraft artillery with pursuit aviation. (Kras—12 Sep 1940)
Security for antiaircraft artillery against aerial attacks. (Kras—23 Oct 1940)
Prophet of the Blitzkrieg. (Nav Inst Proc—May 1941)
Cooperation between aviation and artillery in the penetration of a defensive zone. [See "Foreign Military Digests"]

ANTIAIRCRAFT DEFENSE

Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
The wrong end of the trajectory. (CA Jour—Mar-Apr 1941)
Our A.A. gunners. (Ftg Forc—Feb 1941)
Look aloft! (Inf Jour—Apr 1941)
Cooperation of antiaircraft artillery with pursuit aviation. (Kras—12 Sep 1940)
Aerial landing parties and action against them. (Kras—12 Sep 1940)
Security for antiaircraft artillery against aerial attacks. (Kras—23 Oct 1940)
Fireman! Put out that bomb. (Nation's Bus — May 1941)

ANTITANK

Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
Observations of a British Staff Officer. (Cav Jour—Jan-Feb 1941)
Some thoughts on emplacement of antitank guns. (FA Jour—Mar 1941)

Molotov cocktail. (FA Jour—Apr 1941)
Antitank defense. (FA Jour—May 1941)
Adventure at Jussey. Motorcycle infantry and antitank guns in combat at the railway station. (FA Jour—May 1941)
From the Chief's Office: Antitank-gun company. (Inf Jour—Apr 1941)
The artillery of antitank defense. (Kras—12 Nov 1940)

APPLICATORY EXERCISES

Preparation and execution of tactical exercises of the squad, platoon and company. [See "Foreign Military Digests"]

ARMAMENT

Synchronized arms production. (A Ord—Mar-Apr 1941)
Planned munitions. (A Ord—May-Jun 1941)

ARMORED FORCES

Mechanization on the march. (A Ord—Mar-Apr 1941)
The armored force. (A Ord—May-Jun 1941)
The armored force. (Cav Jour—Jan-Feb 1941)
The Armored Force School. (Cav Jour—Mar-Apr 1941)
The Second Armored Division grows up. (Cav Jour—Mar-Apr 1941)
Field artillery organization, armored force. (FA Jour—Mar 1941)
The artillery in large armored units. (FA Jour—Mar 1941)
Panzers across the Meuse. (FA Jour—Apr 1941)
Antitank defense. (FA Jour—May 1941)
The war in Libya. (Ftg Forc—Feb 1941)
What happened at Sedan. (Inf Jour—Apr 1941)
A Panzer division crosses the Meuse. (Inf Jour—May 1941)
Army and Air Force co-operation. (Jour RUSI—Nov 1940)
"How have the lessons of the War of 1914–1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI—Feb 1941)
Tank reconnaissance during the march. (Kras—23 Sep 1940)
Prophet of the Blitzkrieg. (Nav Inst Proc—May 1941)
Some fundamentals of German military operations. [See page 26]
Armored units on roads to victory. [See page 34]
Tanks against Warsaw. [See "Foreign Military Digests"]
Building a bridge across the Meuse west of Sedan for the crossing of an armored division. [See "Foreign Military Digests"]

ARMY DAY

Army Day. (Rec News—Apr 1941)

ART OF WAR STRATEGY

The Warsaw Campaign, October, 1914. (A Quar—Apr 1941)
General Wetzell's plan for 1914. (A Quar—Apr 1941)
Observations of a British Staff Officer. (Cav Jour—Jan-Feb 1941)
Streamlined command and staff procedure. (Cav Jour—Jan-Feb 1941)
Panzers across the Meuse. (FA Jour—Apr 1941)
Antitank defense. (FA Jour—May 1941)
The value of artillery in modern war. (FA Jour—May 1941)
The war in Libya. (Ftg Forc—Feb 1941)
Traditionalism and military defeat. (Inf Jour—Mar 1941)
Air assault on cities. (Inf Jour—Apr 1941)
Soldier and civilian in total war. (Inf Jour—Apr 1941)
The new mobility. (Inf Jour—Apr 1941)
Morale: first line of defense. (Inf Jour—May 1941)
A Panzer division crosses the Meuse. (Inf Jour—May 1941)
Attack has a twin. Its name is defense. (Inf Jour—May 1941)
Spenser Wilkinson and the defense of Britain. (Jour Amer Mil Inst—Fall 1940)
The French discovery of Clausewitz and Napoleon. (Jour Amer Mil Inst—Fall 1940)
Roots and implications of the German idea of military society. (Jour Amer Mil Inst—Spring 1941)
The art of surprise. (Jour RUSI—Nov 1940)
Army and Air Force co-operation. (Jour RUSI—Nov 1940)
Palestine, 1918—France and Belgium, 1940. (Jour RUSI—Nov 1940)
The Higher Commander. (Jour RUSI—Feb 1941)
"How have the lessons of the War of 1914–1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI—Feb 1941)
The influence of air forces on the course of the war. (Jour RUSI—Feb 1941)
Some lessons of the last war. (Jour RUSI—Feb 1941)
Land warfare. (Jour USII—Jan 1941)
Security for antiaircraft artillery against aerial attacks. (Kras—23 Oct 1940)
Bringing the shock group of a division into combat during defensive action. (Kras—25 Oct 1940)
Escape from encirclement. (Kras—13 Dec 1940)
Lightweight assault troops. (MC Gaz—Mar 1941)
Marvels of organization in the 1914 and 1939 mobilizations. (Mil-Woch—14 Mar 1941)
Assault of a fortified position. (Mil Eng—Mar-Apr 1941)
The survival of the British Empire: 1792–1812, 1914–1940. (Nav Inst Proc—Feb 1941)
A beginner's outline of strategy and tactics. (Nav Inst Proc—May 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc—May 1941)
Flanking, enveloping and breakthrough. (Rev Mil—Dec 1940, Jan 1941)
A few lessons from recent wars. (Rev Mil—Jan 1941)
The war of encounter. (Rv Mil Suisse—Jan 1941)
German strategy: 1914 and 1940. (For Aff—Apr 1941)
War by radio. (For Aff—Apr 1941)
How America can take the offensive. (Fortune—May 1941)
The strategy of the war. (Round Table—Dec 1940, Mar 1941)
Administrative and training phases of leadership. [See page 5]
Division in heaven. [See page 10]
Lessons from World War II. [See page 19]
The motorized division. [See page 24]
Some fundamentals of German military operations. [See page 26]
Current trends in use of engineers in combat. [See page 30]
Breakthrough of the German 63rd Infantry across the Somme, 5-6 June 1940. [See page 46]
Palestine, 1918—France and Belgium, 1940. [See "Foreign Military Digests"]
Changes in air tactics. [See "Foreign Military Digests"]

ARTILLERY

Organization and Equipment

Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
Japanese field artillery. (FA Jour—Mar 1941)
Field artillery organization, armored force. (FA Jour—Mar 1941)
The artillery in large armored units. (FA Jour—Mar 1941)
A suggestion for reinforcement. (FA Jour—Apr 1941)
Artillery support of motorized divisions. (FA Jour—Apr 1941)
Wings for Santa Barbara. (FA Jour—Apr 1941)
An artilleryman's impression of service in Topsy-Turvy Land. (FA Jour—May 1941)
Mechanical prime-movers for artillery. (Kras—26 Oct 1940)

Supply

Wartime procurement of field artillery materiel. (FA Jour—Mar 1941)
A suggestion for reinforcement. (FA Jour—Apr 1941)
The supplying of munitions in the artillery regiment. (Rev Mil—Feb 1941)

Training Tactics

Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
Artillery helps itself. (FA Jour—Mar 1941)
Suggestions for equitation instructors. (FA Jour—Mar 1941)
British artillery in Flanders. (FA Jour—Apr 1941)
Artillery support of motorized divisions. (FA Jour—Apr 1941)
Wings for Santa Barbara. (FA Jour—Apr 1941)
The forward observer. (FA Jour—Apr 1941)
Training artillery intelligence personnel. (FA Jour—Apr 1941)
Making lateral firing easy for beginners. (FA Jour—Apr 1941)
Circular convergence table and firing data card. (FA Jour—Apr 1941)
They start to roll. (FA Jour—May 1941)
Centralized training. (FA Jour—May 1941)
Fire direction. (FA Jour—May 1941)
The value of artillery in modern war. (FA Jour—May 1941)
Artillery in action on the Aisne on June 9. (FA Jour — May 1941)
Conduct of fire. (FA Jour—May 1941)
Learning from the engineers. (FA Jour—May 1941)
Motor Maintenance. (FA Jour—May 1941)
The artillery of antitank defense. (Kras—12 Nov 1940)
Shrapnel firing. (Kras—23 Nov 1940)
Mountain artillery in forest combat. (Kras—15 Dec 1940)
A simple, graphic method of solving a sound-range problem in cases where listening posts are in straight line. (Mil Mitt—Feb 1941)
Cooperation between aviation and artillery in the penetration of a defensive zone. [See "Foreign Military Digests"]

Weapons

Rise and fall of the American "75." (FA Jour—Apr 1941)
Gun procurement. (FA Jour—May 1941)
The artillery of antitank defense. (Kras—12 Nov 1940)

ATTACK

Independent air action. (Aero—31 Jan 1941)
Air assault on cities. (Inf Jour—Apr 1941)
Attack has a twin. It's name is defense. (Inf Jour—May 1941)
Attack action by aviation. (Kras—28 Sep 1940)
Security for antiaircraft artillery against aerial attacks. (Kras—23 Oct 1940)
Attack aviation abroad. (Kras—29 Nov 1940)
The infantry regiment in attack on the Maginot Line. (Kras—3 Dec 1940)
Lessons from World War II. ([See page 19]
Some fundamentals of German military operations. [See page 26]
Breakthrough of the German 63rd Infantry across the Somme, 5-6 June 1940. [See page 46]

AUSTRALIA

Australia. (Round Table—Dec 1940)

B

BAHAMA ISLANDS

The European possessions in the Caribbean area. [See "Book Reviews"]

BALTIC SEA

The Baltic as a theatre of war. The campaign of 1854. (Jour RUSI—Feb 1941)

BARBADOS

The European possessions in the Caribbean area. [See "Book Reviews"]

BERMUDA

Bermuda. (Inf Jour—Apr 1941)

BLOCKADES

Napoleon's counter blockade. (Jour RUSI—Nov 1940)

BRAZIL

Brazil. (Nav Inst Proc—May 1941)

BREAKTHROUGH OPERATIONS

Panzers across the Meuse. (FA Jour—Apr 1941)
What happened at Sedan. (Inf Jour—Apr 1941)
Flanking, enveloping and breakthrough. (Rev Mil—Dec 1940, Jan 1941)
Breakthrough of the German 63rd Infantry across the Somme, 5–6 June 1940. [See page 46]
Cooperation between aviation and artillery in the penetration of a defensive zone. [See "Foreign Military Digests"]
Palestine, 1918—France and Belgium, 1940. [See "Foreign Military Digests"]

BRITISH GUIANA

The European possessions in the Caribbean area. [See "Book Reviews"]

BRITISH HONDURAS

The European possessions in the Caribbean area. [See "Book Reviews"]

C

CAMOUFLAGE

Cavalry camouflage in winter. (Cav Jour—Mar-Apr 1941)
Learning from the engineers. (FA Jour—May 1941)
Aviation camouflage. (Kras—26 Oct 1940)
Modern camouflage. (MC Gaz—Mar 1941)
A review of camouflage literature. (MC Gaz—Mar 1941)
Engineer Board notes: Research in camouflage and concealment facilities. (Mil Eng—Mar-Apr 1941)
An all-purpose camouflage net. (Mil Eng—Mar-Apr 1941)
Present day camouflage. (Res Off—May 1941)
Infra-red rays and their uses. (Rv Mil Suisse—Feb 1941)

CANADA (ARMY OF)

Canada—War—and the U.S.A. (Nation's Bus—May 1941)

CARIBBEAN AREA

The European possessions in the Caribbean area. [See "Book Reviews"]

CASUALTIES

Review of warfare in China. (Kras—16 Nov 1940)

CAVALRY

Command and Staff

The command post of a cavalry regiment (H & M). (Cav Jour—Mar-Apr 1941)

History

The cavalry spirit. (Cav Jour [GB]—Jan 1941)
The Old Hussars. (Cav Jour [GB]—Jan 1941)

Organization and Equipment

The wider role of cavalry. (Cav Jour—Jan-Feb 1941)
Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
Cavalry motorcycle troop. (Cav Jour—Jan-Feb 1941)
Cavalry replacement center. (Cav Jour—Mar-Apr 1941)
Selective service men in cavalry. (Cav Jour—Mar-Apr 1941)
Cavalry packs. (Cav Jour—Mar-Apr 1941)
The remount service. (Cav Jour—Mar-Apr 1941)
Signal communications in the First Cavalry Division. (Cav Jour—Mar-Apr 1941)
Medical service in First Cavalry Division. (Cav Jour—Mar-Apr 1941)
Viewpoint of the division quartermaster. (Cav Jour — Mar-Apr 1941)
Communications within the 4th Cavalry. (Cav Jour—Mar-Apr 1941)
The command post of a cavalry regiment (H & M). (Cav Jour—Mar-Apr 1941)
Cavalry's iron pony. (Cav Jour—Mar-Apr 1941)
The bantam in the scout car platoon. (Cav Jour—Mar-Apr 1941)
The future of the cavalry. (Ftg Forc—Apr 1941)
The cavalry. (Life—21 Apr 1941)

Supply

Supply of horse cavalry regiment. (Cav Jour — Jan-Feb, Mar-Apr 1941)
Viewpoint of the division quartermaster. (Cav Jour — Mar-Apr 1941)

Training Tactics

The wider role of cavalry. (Cav Jour—Jan-Feb 1941)
Artillery, cavalry division. (Cav Jour—Jan-Feb 1941)
Crossing rivers. (Cav Jour—Jan-Feb 1941)
The thousand inch range at the Cavalry School. (Cav Jour—Jan-Feb 1941)
Combats by German cavalry regiments in the east and west. (Cav Jour—Jan-Feb 1941)
German cavalry doctrine. (Cav Jour—Jan-Feb 1941)
Traffic control for administrative marches. (Cav Jour—Jan-Feb 1941)
1940 leadership test, 2d Squadron, 12th Cavalry. (Cav Jour—Jan-Feb 1941)
Horses in chemical warfare. (Cav Jour—Jan-Feb 1941)
Selective service men in cavalry. (Cav Jour—Mar-Apr 1941)
Cavalry camouflage in winter. (Cav Jour—Mar-Apr 1941)
Winter campaigns. (Cav Jour—Mar-Apr 1941)
Mounted attack clarified. (Cav Jour—Mar-Apr 1941)
The motorcycle in march control. (Cav Jour—Mar-Apr 1941)
Ferrying operations. (Cav Jour—Mar-Apr 1941)
Cavalry march training. (Kras—2 Oct 1940)
Cavalry in the Rio de la Plata Wars. (Rev Mil—Jan 1941)

CHEMICAL SERVICE

Horses in chemical warfare. (Cav Jour—Jan-Feb 1941)
The wrong end of the trajectory. (CA Jour—Mar-Apr 1941)
Air assault on cities. (Inf Jour—Apr 1941)
Lightweight assault troops. (MC Gaz—Mar 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc—May 1941)
Detectors of toxic gases. (Rev Mil—Dec 1940)
Fireman! Put out that bomb. (Nation's Bus—May 1941)

CHINA

A century of the China Station. (Jour RUSI—Feb 1941)
The New China. (Fortune—Apr 1941)

CHINA (ARMY OF)

Review of warfare in China. (Kras—16 Nov 1940)

CLAUSEWITZ, Karl von (1780-1831)

The French discovery of Clausewitz and Napoleon. (Jour Amer Mil Inst—Fall 1940)

CLIPPERTON ISLAND

The European possessions in the Caribbean area. [See "Book Reviews"]

COAST ARTILLERY

The wrong end of the trajectory. (CA Jour—Mar-Apr 1941)
A tracer control trainer. (CA Jour—Mar-Apr 1941)
Dry land coast artillery. (CA Jour—Mar-Apr 1941)

COLOMBIA

The European possessions in the Caribbean area. [See "Book Reviews"]

COMMAND, STAFF, AND LOGISTICS

Ordnance field service. The army's system of armament maintenance and supply. (A Ord—May-Jun 1941)
Thoughts on leadership—military and civil. (A Quar—Apr 1941)
Moltke and Conrad. The problems of higher leadership. (A Quar—Apr 1941)
The Austrian plan against Russia, 1914. (A Quar—Apr 1941)
Streamlined command and staff procedure. (Cav Jour—Jan-Feb 1941)
Wartime procurement of field artillery materiel. (FA Jour—Mar 1941)
Gun procurement. (FA Jour—May 1941)
Line of communication. (Ftg Forc—Feb 1941)
Replacements. Life-blood of a fighting army. (Inf Jour—May 1941)
The Higher Commander. (Jour RUSI—Feb 1941)
Airplane ambulance evacuation. (Mil Surg—Mar 1941)
Surgical technique in modern battle. (Mil Surg—Apr 1941)
Mechanized evacuation within the combat regiment. (Mil Surg—Apr 1941)
The art of generalship. (Res Off—May 1941)
Administrative and training phases of leadership. (See page 5]
Some fundamentals of German military operations. [See page 26]
Junior leadership. [See "Foreign Military Digests"]

CONSCRIPTION

Social and political aspects of conscription: Europe's experience. (Jour Amer Mil Inst — Spring 1941)

CONVOYS

Atlantic convoy. (Fortune — Apr 1941)

COUNTERATTACK

Tanks: Arras to Dunkirk. (Inf Jour — Mar-Apr 1941)

D

DEMOLITIONS

Current trends in use of engineers in combat. [See page 30]

DISCIPLINE

What makes an army? (FA Jour — May 1941)
Military punishments in the War of 1812. (Jour Amer Mil Inst — Winter 1940)
Soviet military discipline and disciplinary penalties. (Kras — 22 Oct 1940)

E

ECONOMICS

Export control. (A Ord — Mar-Apr 1941)
Militarism in Japan's foreign policy. (Annals — May 1941)
Japanese war economy. (Annals — May 1941)
Japan's southward advance — economic and political. (Annals — May 1941)
The European possessions in the Caribbean area. [See "Book Reviews"]

EDUCATION (MILITARY)

The ability to learn. (Inf Jour — Mar 1941)

EFFICIENCY REPORTS

Streamlining the efficiency report. (CA Jour — Mar-Apr 1941)

EGYPT

The persistence of the Egyptian factor in Mediterranean strategy. (Nav Inst Proc — May 1941)

ENCIRCLEMENT

Escape from encirclement. (Kras — 13 Dec 1940)

ENGINEERS

Learning from the engineers. (FA Jour — May 1941)
Modern camouflage. (MC Gaz — Mar 1941)
Assault of a fortified position. (Mil Eng — Mar-Apr 1941)
Field training in engineer operations. (Mil Eng — Mar-Apr 1941)
Malta — Crossroads of the Mediterrean. (Mil Eng — Mar-Apr 1941)
Training a selectee to be an engineer soldier. (Mil Eng — Mar-Apr 1941)
Fort Leonard Wood, Missouri. (Mil Eng — Mar-Apr 1941)
Engineers in battle. (Mil Eng — Mar-Apr 1941)
Engineer Board notes: Research in camouflage and concealment facilities. (Mil Eng — Mar-Apr 1941)
Great Lakes ports and waterways. (Mil Eng — Mar-Apr 1941)
New engineer units. (Mil Eng — Mar-Apr 1941)
An all-purpose camouflage net. (Mil Eng — Mar-Apr 1941)
Present day camouflage. (Res Off — May 1941)
The invisible bridge over the Meuse at St. Mihiel, 1918. (Rev Mil — Feb 1941)
Small change from Dunkirk. (Roy Eng Jour — Mar 1941)
The German passage of the Danube, 22nd–26th November, 1916. (Roy Eng Jour — Mar 1941)
The elements of hill road making. (Roy Eng Jour — Mar 1941)
River training works. (Roy Eng Jour — Mar 1941)
Mechanization of R.E. units from 1914 to 1937. (Roy Eng Jour — Mar 1941)
Aerdrome construction for British Commonwealth air training plan. (Roy Eng Jour — Mar 1941)
Lessons from World War II. [See page 19]
Current trends in use of engineers in combat. [See page 30]
Armored units on roads to victory. [See page 34]
Heroes of the "Fast Troops." [See "Foreign Military Digests"]
Technical considerations for the engineers regarding the employment of the army construction troops in an advance. [See "Foreign Military Digests"]
Building a bridge across the Meuse west of Sedan for the crossing of an armored division. [See "Foreign Military Digests"]

EQUITATION

Suggestions for equitation instructors. (FA Jour — Mar 1941)

EUROPE

What is Europe? (La France Mil — 25 Jan 1941)
Social and political aspects of conscription: Europe's experience. (Jour Amer Mil Inst — Spring 1941)
The problem of food shortage in Europe. (Round Table — Dec 1940)

EVOLUTION OF TACTICS

Traditionalism and military defeat. (Inf Jour — Mar 1941)

F

FORTIFICATIONS

"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
The infantry regiment in attack on the Maginot Line. (Kras — 3 Dec 1940)
Assault of a fortified position. (Mil Eng — Mar-Apr 1941)
Malta — Crossroads of the Mediterranean. (Mil Eng — Mar-Apr 1941)
Current trend in uses of engineers in combat. [See page 30]

FRANCE

Youth called to "Youth Workshops" may not undertake any school work. (La France Mil — 25 Jan 1941)

FRANCE (ARMY OF)

The Old Hussars. (Cav Jour [GB] — Jan 1941)
What makes an army? (FA Jour — May 1941)
The French discovery of Clausewitz and Napoleon. (Jour Amer Mil Inst — Fall 1940)
The Corps of the White Cockade. (Jour RUSI — Feb 1941)

FRENCH GUIANA

The European possessions in the Caribbean area. [See "Book Reviews"]

G

GEOGRAPHY (MILITARY)

Our unknown Pacific Islands. (Harpers — Apr 1941)
The European possessions in the Caribbean area. [See "Book Reviews"]

GERMANY (ARMY OF)

Command and Staff

Moltke and Conrad. The problems of higher leadership. (A Quar — Apr 1941)
The staff of the German Army. [See "Foreign Military Digests"]

Organization and Equipment

The credit of the Luftwaffe. (Aero — 7 Feb 1941)
The artillery in large armored units. (FA Jour — Mar 1941)
Artillery helps itself. (FA Jour — Mar 1941)
What makes an army? (FA Jour — May 1941)
The German war machine. (Ftg Forc — Feb 1941)
German signal forces. (Kras — 13 Sep 1940)
German and British pursuit aviation. (Kras — 7 Dec 1940)
A visit to the German Army Medical Service in 1937. (Mil Surg — Apr 1941)
The "Stukas" return. (Ill Lon News — 28 Jan 1941)
German incendiary bombs: clockwork and electric types in use. (Ill Lon News — 1 Mar 1941)
Some fundamentals of German military operations. [See page 26]
Parachute troops. [See "Foreign Military Digests"]

Personnel

What a German soldier thinks about. (Inf Jour — May 1941)
Recruitment. (Mil-Woch — 7 Feb 1941)

Training

Combats by German cavalry regiments in the east and west. (Cav Jour — Jan-Feb 1941)
German cavalry doctrine. (Cav Jour — Jan-Feb 1941)
The forward observer. A tactical problem illustrating the actions of a forward observer, and how artillery-infantry liaison operates in the German Army. (FA Jour — Apr 1941)
The value of artillery in modern war. (FA Jour — May 1941)
What makes an army? (FA Jour — May 1941)
The new mobility. (Inf Jour — Apr 1941)
What a German soldier thinks about. (Inf Jour — May 1941)
Roots and implications of the German idea of military society. (Jour Amer Mil Inst — Spring 1941)
Certain conclusions from air force action in the west. (Kras — 22 Oct 1940)
The infantry regiment in attack on the Maginot Line. (Kras — 3 Dec 1940)
Combat at close quarters. (Kras — 9, 13, 14 Dec 1940)
The advance of a German infantry regiment on Dunkirk. (Kras — 17 Dec 1940)
German soldiery. A reconnaissance detachment at Liége. (Mil-Woch — 28 Mar 1941)
German motor transport troops in Iraq. (Panzer — Mar 1941)
German strategy: 1914 and 1940. (For Aff — Apr 1941)
Some fundamentals of German military operations. [See page 26]
Current trends in use of engineers in combat. [See page 30]
Armored units on roads to victory. [See page 34]
Breakthrough of the German 63d Infantry across the Somme, 5-6 June 1940. [See page 46]
German tactics in their aerial attacks on London. [See "Foreign Military Digests"]
Preparation and execution of tactical exercises of the squad, platoon and company. [See "Foreign Military Digests"]
Motorized detachment in Holland. [See "Foreign Military Digests"]
Technical considerations for the engineers regarding the employment fthe army construction troops in an advance. [See "Foreign Military Digests"]
Building a bridge across the Meuse west of Sedan for the crossing of an armored division. [See "Foreign Military Digests"]

GERMANY (NAVY OF)

The death of a fleet. (Nav Inst Proc — Mar 1941)

GREAT BRITAIN (ARMY OF)

Command and Staff

Parliament and the war. (Ftg Forc — Feb 1941)

Entertainment

The work of the N.A.A.F.I. entertainments branch. (Jour RUSI — Feb 1941)

History

England in continental war. (Ftg Forc — Feb 1941)

Mobilization

England's preparedness potentiality at the outbreak of war in 1939. (Mil Mitt — Mar 1941)

Organization and Equipment

The cavalry spirit. (Cav Jour [GB] — Jan 1941)
British artillery in Flanders. (FA Jour — Apr 1941)
Our A.A. gunners. (Ftg Forc — Feb 1941)
The future of the cavalry. (Ftg Forc — Apr 1941)
The toll of our anti-aircraft batteries. (Jour RUSI — Feb 1941)
German and British pursuit aviation. (Kras — 7 Dec 1940)
Mechanization of R.E. units from 1914 to 1937. (Roy Eng Jour — Mar 1941)
Aerodrome construction for British Commonwealth air training plan. (Roy Eng Jour — Mar 1941)
The Home Guard. (Tank — Feb 1941) [See also, "Foreign Military Digests"]
The Home Guard. (Round Table — Dec 1940)
Changes in air tactics. [See "Foreign Military Digests"]

Personnel

British advice to junior officers. (Inf Jour — Apr 1941)

Training

Independent air action. (Aero — 31 Jan 1941)
Try it out. (Aero — 31 Jan 1941)
The war in the air. (Aero — 21 Feb 1941)
The growing night offensive. (Aero — 7 Mar 1941)
The R.A.F. in the first half of the second year of war. (A Quar — Apr 1941)
Centralized training. (FA Jour — May 1941)
The Army in 1940. (Ftg Forc — Feb 1941)
The Air War, 1940. (Ftg Forc — Feb 1941)
Army estimates. (Ftg Forc — Apr 1941)
Air estimates. (Ftg Forc — Apr 1941)
Spenser Wilkinson and the defense of Britain. (Jour Amer Mil Inst — Fall 1940)
The English soldier in the Campaign of Agincourt. (Jour Amer Mil Inst — Winter 1940)
The Higher Commander. (Jour RUSI — Feb 1941)
General Wavell on the training of the army for war. [See "Foreign Military Digests"]
Changes in air tactics. [See "Foreign Military Digests"]

GREAT BRITAIN (NAVY OF)

The war at sea. December, 1940-February, 1941. (A Quar — Apr 1941)
The promotion of captains in the Royal Navy. (Ftg Forc — Feb 1941)
The Navy in 1940. (Ftg Forc — Feb 1941)
Naval estimates. (Ftg Forc — Apr 1941)
A century of the China Station. (Jour RUSI — Feb 1941)
Who sunk the Hampshire? (MC Gaz — Mar 1941)
The survival of the British Empire: 1792-1812, 1914-1940. (Nav Inst Proc — Feb 1941)

Atlantic convoy. (Fortune — Apr 1941)
Britain's great bastion in the east: Singapore, stubborn obstacle to Japan's ambitious projects in Southern Asia. (Ill Lon News — 1 Mar 1941)
Battleship or aircraft carrier. [See "Foreign Military Digests"]

GREECE

Greece — bridge to the Orient. (Mil-Woch — 14 Mar 1941)

GUADELOUPE and DEPENDENCIES

The European possessions in the Caribbean area. [See "Book Reviews"]

H

HISTORY (MILITARY)

Spenser Wilkinson and the defense of Britain. (Jour Amer Mil Inst — Fall 1940)

I

INFANTRY

Organization and Equipment

Our organization for defense. (Inf Jour — Mar 1941)
Snow birds. (Inf Jour — Mar 1941)
From the Chief's Office: The intelligence platoon. (Inf Jour — Mar 1941)
From the Chief's Office: Antitank-gun company. (Inf Jour — Apr 1941)
15th Infantry Ski-Patrol. (Res Off — Apr 1941)

Training Tactics

The forward observer. A tactical problem illustrating the actions of a forward observer, and how artillery-infantry liaison operates in the German Army. (FA Jour — Apr 1941)
Adventure at Jussey. Motorcycle infantry and antitank guns in combat at the railway station. (FA Jour — May 1941)
Single-handed. (Inf Jour — Mar 1941)
Tanks: Arras to Dunkirk. (Inf Jour — Mar, Apr 1941)
Short cuts in rifle training. (Inf Jour — Apr 1941)
Air infantry. (Kras — 27 Sep 1940)
The infantry regiment in attack on the Maginot Line. (Kras — 3 Dec 1940)
The advance of a German infantry regiment on Dunkirk. (Kras — 17 Dec 1940)
An analysis of the crossing of the Meuse River by 2d Division A.E.F. on 10-11 November, 1918. (MC Gaz — Mar 1941)
The new Swiss infantry drill regulations. (Mil-Woch — 21 Feb 1941)
German soldiery. Our company attacks Calais. (Mil-Woch — 7 Mar 1941)
15th Infantry Ski-Patrol. (Res Off — Apr 1941)
Combat firing instruction in the infantry. (Rev Mil — Jan 1941)
Division in heaven. [See page 10]
Breakthrough of the German 63d Infantry across the Somme, 5-6 June 1940. [See page 46]
General Wavell on the training of the army for war. [See "Foreign Military Digests"]
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]
The tank company in forest combat. [See "Foreign Military Digests"]

INTELLIGENCE (MILITARY)

The credit of the Luftwaffe. (Aero — 7 Feb 1941)
Training artillery intelligence personnel. (FA Jour — Apr 1941)
From the Chief's Office: The intelligence platoon. (Inf Jour — Mar 1941)
How America can take the offensive. (Fortune — May 1941)
Reconnaissance by "Schnelle Truppen" (Fast Troops). [See "Foreign Military Digests"]

INTERNATIONAL RELATIONS

Peru. (Mil Eng — Mar-Apr 1941)
Militarism in Japan's foreign policy. (Annals — May 1941)
Japanese war economy. (Annals — May 1941)
Japan's southward advance — economic and political. (Annals — May 1941)
Canada — War — and the U.S.A. (Nation's Bus — May 1941)

IRELAND

Ireland in the vortex. (Round Table — Dec 1940)

ITALY (ARMY OF)

Italian operations in the Alps. (Kras — 6 Oct 1940)

ITALY (NAVY OF)

The modern Italian Navy. I. Before 1900. (Jour Amer Mil Inst — Spring 1941)

J

JAMAICA

The European possessions in the Caribbean area. [See "Book Reviews"]
Around the bases: Jamaica. (Inf Jour — May 1941)

JAPAN (ARMY OF)

Japan's air strength. (Aero — 7 Mar 1941)
Japanese field artillery. (FA Jour — Mar 1941)
Review of warfare in China. (Kras — 16 Nov 1940)
Militarism in Japan's foreign policy. (Annals — May 1941)
Japanese war economy. (Annals — May 1941)
Japan's southward advance — economic and political. (Annals — May 1941)
In greater East Asia. (Fortune — Apr 1941)

JOMINI, Antoine Henri, Baron (1779-1869)

The French discovery of Clausewitz and Napoleon. (Jour Amer Mil Inst — Fall 1940)

L

LANDING OPERATIONS

Lightweight assault troops. (MC Gaz — Mar 1941)

LARGE UNITS

Division

Artillery, cavalry division. (Cav Jour — Jan-Feb 1941)
The Second Armored Division grows up. (Cav Jour — Mar-Apr 1941)
Viewpoint of the division quartermaster. (Cav Jour — Mar-Apr 1941)
The artillery in large armored units. (FA Jour — Mar 1941)
Artillery support of motorized divisions. (FA Jour — Apr 1941)
Air-landing divisions. (Inf Jour — Apr 1941)
A Panzer division crosses the Meuse. (Inf Jour — May 1941)
Bringing the shock group of a division into combat during defensive action. (Kras — 25 Oct 1940)
Eclipse of a division. (Roy Eng Jour — Mar 1941)
Division in heaven. [See page 10]
The motorized division. [See page 24]

LEADERSHIP

Thoughts on leadership — military and civil. (A Quar — Apr 1941)
Moltke and Conrad. The problems of higher leadership. (A Quar — Apr 1941)
1940 leadership test, 2d Squadron, 12th Cavalry. (Cav Jour — Jan-Feb 1941)
Leader or adviser? (Cav Jour — Mar-Apr 1941)
What makes an army? (FA Jour — May 1941)
British advice to junior officers. (Inf Jour — Apr 1941)
The art of surprise. (Jour RUSI — Nov 1940)
The Higher Commander. (Jour RUSI — Feb 1941)
The art of generalship. (Res Off — May 1941)
A few words to young officers. (Rev Mil — Feb 1941)
Administrative and training phases of leadership. [See page 5]
Some fundamentals of German military operations. [See page 26]
Junior leadership. [See "Foreign Military Digests"]
General Wavell on the training of the army for war. [See "Foreign Military Digests"]
A few words to young officers. [See "Foreign Military Digests"]

LEEWARD ISLANDS OF GREAT BRITAIN

The European possessions in the Caribbean area. [See "Book Reviews"]

LIAISON

Artillery, cavalry division. (Cav Jour — Jan-Feb 1941)
Artillery support of motorized divisions. (FA Jour — Apr 1941)
The forward observer. A tactical problem illustrating the actions of a forward observer, and how artillery-infantry liaison operates in the German Army. (FA Jour — Apr 1941)
Training artillery intelligence personnel. (FA Jour — Apr 1941)
Army and Air Force co-operation. (Jour RUSI — Nov 1940)
Cooperation of antiaircraft artillery with pursuit aviation. (Kras — 12 Sep 1940)
Some fundamentals of German military operations. [See page 26]
Armored units on roads to victory. [See page 34]
Cooperation between aviation and artillery in the penetration of a defensive zone. [See "Foreign Military Digests"]
The tank company in forest combat. [See "Foreign Military Digests"]

M

MACHINE GUNS

The Johnson light machine gun. (A Ord — May-Jun 1941)
The thousand inch range at the Cavalry School. (Cav Jour —Jan-Feb 1941)
Concerning wind-drift correction tables in machine-gun firing. (Rev Mil — Dec 1940)

MAHAN, Admiral Alfred Thayer (1840-1914)

Meeting to commemorate the centenary of the birth of Admiral Alfred Thayer Mahan, U.S.N. (Jour RUSI — Nov 1940)

MALTA

Malta — Crossroads of the Mediterranean. (Mil Eng — Mar-Apr 1941)

MANEUVERS

Offensive action by reinforced regiment. (Kras — 5 Sep 1940)
The medical service at the First Army maneuvers of 1940 with special reference to the work of the first evacuation hospital. (Mil Surg — May 1941)
Preparation and execution of tactical exercises of the squad, platoon and company. [See "Foreign Military Digests"]

MAP PROBLEMS

The forward observer. A tactical problem illustrating the actions of a forward observer, and how artillery-infantry liaison operates in the German Army. (FA Jour — Apr 1941)
Tactical problem of a reinforced battalion. (Rev Mil — Dec 1940, Feb 1941)

MARCHES

Mechanization on the march. (A Ord — Mar-Apr 1941)
Traffic control for administrative marches. (Cav Jour — Jan-Feb 1941)
1940 leadership test, 2d Squadron, 12th Cavalry. (Cav Jour —Jan-Feb 1941)
The motorcycle in march control. (Cav Jour — Mar-Apr 1941)
Tank reconnaissance during the march. (Kras — 23 Sep 1940)
Cavalry march training. (Kras — 2 Oct 1940)
The war of encounter. (Rv Mil Suisse — Jan 1941)
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]

MARINE CORPS

Island defense. (MC Gaz — Mar 1941)
Lightweight assault troops. (MC Gaz — Mar 1941)
An analysis of the crossing of the Meuse River by 2d Division A.E.F. on 10-11 November, 1918. (MC Gaz — Mar 1941)
Hilton Head and Port Royal, 1861. (MC Gaz — Mar 1941)
As it was before. (In 1917-1918.) (MC Gaz — Mar 1941)
A critique of Reserve training. (MC Gaz — Mar 1941)

MARKSMANSHIP

Short cuts in rifle training. (Inf Jour — Apr 1941)

MARTINIQUE

The European possessions in the Caribbean area. [See "Book Reviews"]

MECHANIZATION

Mechanization on the march. (A Ord — Mar-Apr 1941)
The armored force. (A Ord — May-Jun 1941)
The wider role of cavalry. (Cav Jour — Jan-Feb 1941)
Observations of a British Staff Officer. (Cav Jour — Jan-Feb 1941)
The Armored Force School. (Cav Jour — Mar-Apr 1941)
The Second Armored Division grows up. (Cav Jour — Mar-Apr 1941)
The motorcycle in march control. (Cav Jour — Mar-Apr 1941)
Field artillery organization, armored force. (FA Jour — Mar 1941)
The artillery in large armored units. (FA Jour — Mar 1941)
Artillery support of motorized divisions. (FA Jour — Apr 1941)
The war in Libya. (Ftg Forc — Feb 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
The new mobility. (Inf Jour — Apr 1941)
Army and Air Force co-operation. (Jour RUSI — Nov 1940)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
Mechanized evacuation within the combat regiment. (Mil Surg — Apr 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc — May 1941)
Mechanization of R.E. units from 1914 to 1937. (Roy Eng Jour — Mar 1941)
The cavalry. (Life — 21 Apr 1941)
Lessons from World War II. [See page 19]
Some fundamentals of German military operations. [See page 26]

MEDICAL SERVICE

War casualties, 1917-1918. (A Med Bul — Jan 1941)
The medical officers' responsibility in the present emergency. (A Med Bul — Jan 1941)
Ten Commandments for health. (A Med Bul — Jan 1941)
Medical service in First Cavalry Division. (Cav Jour — Mar-Apr 1941)
The use of plasma. (Jour RAMC — Jan 1941)
Army blood transfusion service technique for the filtration of blood plasma. (Jour RAMC — Jan 1941)
Gunshot wounds of the head in 1940. (Jour RAMC — Jan 1941)
Food: Use of potato flour. (Jour RAMC — Mar 1941)
A portable disinfestor. (Jour RAMC — Mar 1941) [See also, "Foreign Military Digests"]
Physiological and psychological characteristics of successful pilots. (Mil Surg — Mar 1941)
Airplane ambulance evacuation. (Mil Surg — Mar 1941)
So-called "shell shock": types, etiological factors and means for its prevention. (Mil Surg — Mar 1941)
A visit to the German Army Medical Service in 1937. (Mil Surg — Apr 1941)
Gunshot wounds. (Mil Surg — Apr 1941)
Surgical technique in modern battle. (Mil Surg — Apr 1941)
Mechanized evacuation within the combat regiment. (Mil Surg — Apr 1941)
The diary of Assistant Surgeon Leonard McPhail on his journey to the Southwest in 1835. (Mil Surg — Apr 1941)
The medical service at the First Army maneuvers of 1940 with special reference to the work of the first evacuation hospital. (Mil Surg — May 1941)
A proposal for the training of officers of the Medical Department Reserve Corps, U.S. Army. (Mil Surg — May 1941)
Military psychiatry. (Mil Surg — May 1941)
Advantages of motorized medical units in the transportation and treatment of the wounded in war. (Rev Mil — Dec 1940)
The problem of tuberculosis in our army. (Rev Mil — Feb 1941)

MEDITERRANEAN

The persistence of the Egyptian factor in Mediterranean strategy. (Nav Inst Proc — May 1941)

MEETING ENGAGEMENTS

The war of encounter. (Rv Mil Suisse—Jan 1941)
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]
Meeting engagements of tanks in the strategical depth of the enemy. [See "Foreign Military Digests"]

METEOROLOGY

Meteorological problems in military aviation. (Rev Mil — Dec 1940)

MILITARISM

Roots and implications of the German idea of military society. (Jour Amer Mil Inst — Spring 1941)

MINES

Antitank defense. (FA Jour — May 1941)
"Position" land-mining a road surface for depth-charge. (Ill Lon News — 22 Feb 1941)

MOBILITY

Mechanization on the march. (A Ord — Mar-Apr 1941)
The armored force. (A Ord — May-Jun 1941)
Artillery, cavalry division. (Cav Jour — Jan-Feb 1941)
German cavalry doctrine. (Cav Jour — Jan-Feb 1941)
Cavalry motorcycle troop. (Cav Jour — Jan-Feb 1941)
Cavalry's iron pony. (Cav Jour — Mar-Apr 1941)
Artillery helps itself. (FA Jour — Mar 1941)
Antitank defense. (FA Jour — May 1941)
The value of artillery in modern war. (FA Jour — May 1941)
The war in Libya. (Ftg Forc — Feb 1941)
Our organization for defense. (Inf Jour — Mar 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
The new mobility. (Inf Jour — Apr 1941)
Army and Air Force co-operation. (Jour RUSI — Nov 1940)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
Land warfare. (Jour USII — Jan 1941)
Mechanical prime-movers for artillery. (Kras — 26 Oct 1940)
The army "Bug." (QM Rev — Mar-Apr 1941)
Lessons from World War II. [See page 19]
The motorized division. [See page 24]
Some fundamentals of German military operations. [See page 26]
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]

MOBILIZATION

Replacements. Life-blood of a fighting army. (Inf Jour — May 1941)
Marvels of organization in the 1914 and 1939 mobilizations. (Mil-Woch — 14 Mar 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)

Industrial Mobilization

Organization for production. (A Ord — Mar-Apr 1941)
Synchronized arms production. (A Ord — Mar-Apr 1941)
Mass production of combat tanks. (A Ord — Mar-Apr 1941)
Planned munitions. (A Ord — May-Jun 1941)
A clearer voice for democracy. (Inf Jour — Mar 1941)
Soldier and civilian in total war. (Inf Jour — Apr 1941)
Money, production, and time. (Inf Jour — May 1941)
England's preparedness potentiality at the outbreak of war in 1939. (Mil Mitt — Mar 1941)

MORALE (MILITARY)

Morale: first line of defense. (Inf Jour — May 1941)
Some fundamentals of German military operations. [See page 26]

MOTORCYCLES

Cavalry motorcycle troop. (Cav Jour — Jan-Feb 1941)
Traffic control for administrative marches. (Cav Jour — Jan-Feb 1941)
The motorcycle in march control. (Cav Jour — Mar-Apr 1941)
Adventure at Jussey. Motorcycle infantry and antitank guns in combat at the railway station. (FA Jour — May 1941)

MOTORIZATION

Mechanization on the march. (A Ord — Mar-Apr 1941)
Artillery, cavalry division. (Cav Jour — Jan-Feb 1941)
Combats by German cavalry regiments in the east and west. (Cav Jour — Jan-Feb 1941)
The motorcycle in march control. (Cav Jour — Mar-Apr 1941)
Cavalry's iron pony. (Cav Jour — Mar-Apr 1941)
The bantam in the scout car platoon. (Cav Jour — Mar-Apr 1941)
Driving in open terrain. (CA Jour — Mar-Apr 1941)
Artillery helps itself. (FA Jour — Mar 1941)
Artillery support of motorized divisions. (FA Jour — Apr 1941)
The value of artillery in modern war. (FA Jour — May 1941)
Motor maintenance. (FA Jour — May 1941)
The war in Libya. (Ftg Forc — Feb 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
Air-landing divisions. (Inf Jour — Apr 1941)
The new mobility. (Inf Jour — Apr 1941)
Starting (motors) in cold weather. (Panzer — Jan, Feb 1941)
Safeguards to prevent freezing of air-brakes. (Panzer — Mar 1941)
German motor transport troops in Iraq. (Panzer — Mar 1941)
Motor replacement parts. (QM Rev — Mar-Apr 1941)
The army "Bug." New quarter-ton command reconnaissance car. (QM Rev — Mar-Apr 1941)
Motor transport and the national defense. (QM Rev — Mar-Apr 1941)
Advantages of motorized medical units in the transportation and treatment of the wounded in war. (Rev Mil — Dec 1940)
Lessons from World War II. [See page 19]
The motorized division. [See page 24]
Some fundamentals of German military operations. [See page 26]
Armored units on roads to victory. [See page 34]
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]
Motorized detachment in Holland. [See "Foreign Military Digests"]
Motorized reconnaissance detachment in combat in Flanders. [See "Foreign Military Digests"]

N

NAPOLEON I, Emperor of the French (1769-1821)

The French discovery of Clausewitz and Napoleon. (Jour Amer Mil Inst — Fall 1940)

NATIONAL DEFENSE

Export control. (A Ord — Mar-Apr 1941)
Synchronized arms production. (A Ord — Mar-Apr 1941)
Philippine national defense. (CA Jour — Mar-Apr 1941)
An artilleryman's impression of service in Topsy-Turvy Land. (FA Jour — May 1941)
Our organization for defense. (Inf Jour — Mar 1941)
First base (Newfoundland). (Inf Jour — Mar 1941)
The ability to learn. (Inf Jour — Mar 1941)
Soldier and civilian in total war. (Inf Jour — Apr 1941)
Money, production, and time. (Inf Jour — May 1941)
Around the bases: Jamaica. (Inf Jour — May 1941)
Spenser Wilkinson and the defense of Britain. (Jour Amer Mil Inst — Fall 1940)
National defense: A program of studies. (Jour Amer Mil Inst — Fall 1940)
Social and political aspects of conscription: Europe's experience. (Jour Amer Mil Inst — Spring 1941)
American sea power — 1941 and beyond. (Nav Inst Proc — Apr 1941)
Motor transport and the national defense. (QM Rev — Mar-Apr 1941)
Emigration and national defense. (Rv Mil Suisse — Feb 1941)
Militarism in Japan's foreign policy. (Annals — May 1941)
Japanese war economy. (Annals — May 1941)
The naval defense of America. (Harpers — Apr 1941)
Britain's great bastion in the east: Singapore, stubborn obstacle to Japan's ambitious projects in Southern Asia. (Ill Lon News — 1 Mar 1941)
U.S. strategic Pacific sites, which envelop Japan at all points. (Ill Lon News — 1 Mar 1941)
The war with Nazi Germany: The Far East. (Ill Lon News — 1 Mar 1941)
Fireman! Put out that bomb. (Nation's Bus — May 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)
National Defense: Strategy. (Time — 12 May 1941)

NAVAL WARFARE

The war at sea. December, 1940-February, 1941. (A Quar —Apr 1941)
Down Mobile. (CA Jour — Mar-Apr 1941)
The Navy in 1940. (Ftg Forc — Feb 1941)
Naval estimates. (Ftg Forc — Apr 1941)
Meeting to commemorate the centenary of the birth of Admiral Alfred Thayer Mahan, U.S.N. On Friday, 27th September, 1940, at 3 p.m. (Jour RUSI — Nov 1940)
The first year of the War, 1939-40. (Jour RUSI — Nov 1940)
Napoleon's counter blockade. (Jour RUSI — Nov 1940)
The Baltic as a theatre of war. The campaign of 1854. (Jour RUSI — Feb 1941)
Hilton Head and Port Royal, 1861. (MC Gaz — Mar 1941)
Who sunk the Hampshire? (MC Gaz — Mar 1941)
Sea warfare today. (Mil Mitt — Jan 1941)
Contemporary defense sketches: Dakar. (Mil Mitt — Feb 1941)
Future cruisers. (Nav Inst Proc — Feb 1941)
Blockaders off the American coast. (Nav Inst Proc — Feb 1941)
The survival of the British Empire: 1792-1812, 1914-1940. (Nav Inst Proc — Feb 1941)
The death of a fleet. (Nav Inst Proc — Mar 1941)
American sea power — 1941 and beyond. (Nav Inst Proc — Apr 1941)
Modern submarine versus major warship. (Nav Inst Proc — Apr 1941)
A beginner's outline of strategy and tactics. (Nav Inst Proc — May 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc — May 1941)
Let's try a new weapon. (Nav Inst Proc — May 1941)
Atlantic convoy. (Fortune — Apr 1941)
U.S. naval strategy. (Fortune — Jun 1941)
The naval defense of America. (Harpers — Apr 1941)
Our unknown Pacific Islands. (Harpers — Apr 1941)
The Sicilian Straits: The vital channel in the Mediterranean War. (Ill Lon News — 28 Jan 1941)
Britain's great bastion in the east: Singapore, stubborn obstacle to Japan's ambitious projects in Southern Asia. (Ill Lon News — 1 Mar 1941)
U.S. strategic Pacific sites, which envelop Japan at all points. (Ill Lon News — 1 Mar 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)
The strategy of the war. (Round Table — Dec 1940, Mar 1941)
Dakar. [See "Foreign Military Digests"]
Battleship or aircraft carrier. [See "Foreign Military Digests"]

NEWFOUNDLAND

First base. (Inf Jour — Mar 1941)

NEW ZEALAND

New Zealand. (Round Table — Dec 1940)

NIGHT OPERATIONS

The growing night offensive. (Aero — 7 Mar 1941)
Night raid. (Kras — 9 Dec 1940)
German tactics in their aerial attacks on London. [See "Foreign Military Digests"]

O

OBSTACLES

Learning from the engineers. (FA Jour — May 1941)
Current trends in use of engineers in combat. [See page 30]
Tanks against Warsaw. [See "Foreign Military Digests"]

OIL

Oil requirements and distribution. (Mil-Woch — 4 Apr 1941)

ORDNANCE

Ordnance service in our new army. (A Ord — Mar-Apr 1941)
Organization for production. (A Ord — Mar-Apr 1941)
Forging high-explosive shell. (A Ord — Mar-Apr 1941)
Synchronized arms production. (A Ord — Mar-Apr 1941)
Mass production of combat tanks. (A Ord — Mar-Apr 1941)
Our arms grow strong. (A Ord — May-Jun 1941)
Civilian ordnance training. (A Ord — May-Jun 1941)
Planned munitions. (A Ord — May-Jun 1941)
The Ordnance Training Center. (A Ord — May-Jun 1941)
Ordnance field service. (A Ord — May-Jun 1941)
Ordnance field service in the Army of the United States. (A Ord — May-Jun 1941)
The Johnson light machine gun. (A Ord — May-Jun 1941)
Sub-Caliber devices at Fort Knox. (Cav Jour — Mar-Apr 1941)
The wrong end of the trajectory. (CA Jour — Mar-Apr 1941)
Wartime procurement of field artillery materiel. (FA Jour — Mar 1941)
Rise and fall of the American "75." (FA Jour — Apr 1941)
Gun procurement. (FA Jour — May 1941)
Shrapnel firing. (Kras — 23 Nov 1940)
Big Bertha, 1855 style. (Nav Inst Proc — Feb 1941)
German incendiary bombs: clockwork and electric types in use. (Ill Lon News — 1 Mar 1941)

ORGANIZATION (MILITARY)

Traditionalism and military defeat. (Inf Jour — Mar 1941)
Replacements. Life-blood of a fighting army. (Inf Jour — May 1941)

P

PACIFIC ISLANDS

Our unknown Pacific Islands. (Harpers — Apr 1941)
U.S. strategic Pacific sites, which envelop Japan at all points. (Ill Lon News — 1 Mar 1941)

PANAMA

An artilleryman's impression of service in Topsy-Turvy Land (FA Jour — May 1941)
An eighteenth century Spanish military camp in Panama. (FA Jour — May 1941)
National defense: Strategy. (Time — 12 May 1941)

PARACHUTES

The war in the air. (Aero — 21 Feb 1941)
Air-landing divisions. (Inf Jour — Apr 1941)
Look aloft! (Inf Jour — Apr 1941)
Are parachute troops practical? (Res Off — Apr 1941)
Division in heaven. [See page 10]
Lessons from World War II. [See page 19]
Function of parachutista. [See "Foreign Military Digests"]
Parachute troops. [See "Foreign Military Digests"]

PERU

Peru. (Mil Eng — Mar-Apr 1941)

PHILIPPINE ARMY

Philippine national defense. (CA Jour — Mar-Apr 1941)

PHOTOGRAPHY

Aerial Photography

Training artillery intelligence personnel. (FA Jour — Apr 1941)
Infra-red rays and their uses. (Rv Mil Suisse — Feb 1941)

PRINCIPLES OF WAR

Land warfare. (Jour USII — Jan 1941)
Lessons from World War II. [See page 19]
Breakthrough of the German 63d Infantry across the Somme, 5-6 June 1940. [See page 46]

PROMOTION

The promotion of captains in the Royal Navy. (Ftg Forc — Feb 1941)

PROPAGANDA

A clearer voice for democracy. (Inf Jour — Mar 1941)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
War by radio. (For Aff — Apr 1941)
How America can take the offensive. (Fortune — May 1941)

PSYCHOLOGY (MILITARY)

Morale: first line of defense. (Inf Jour — May 1941)
How America can take the offensive. (Fortune — May 1941)

PUERTO RICO

National defense: Strategy. (Time — 12 May 1941)

Q

QUARTERMASTER SERVICE

The remount service. (Cav Jour — Mar-Apr 1941)
Viewpoint of the division quartermaster. (Cav Jour — Mar-Apr 1941)
Motor replacement parts. (QM Rev — Mar-Apr 1941)
Construction of defendum range. (QM Rev — Mar-Apr 1941)
A soldiers' city rises from the dust. (QM Rev — Mar-Apr 1941)
The army "Bug." (QM Rev — Mar-Apr 1941)
Action in Atlanta! (QM Rev — Mar-Apr 1941)
Motor transport and the national defense. (QM Rev — Mar-Apr 1941)
Supply takes to the air. (QM Rev — Mar-Apr 1941)

The Quartermaster Problem. Use of government transportation requests. (QM Rev — Mar-Apr 1941)
Camps for 1,418,000. (Fortune — May 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)

R

RADIO COMMUNICATION

War by radio. (For Aff — Apr 1941)

RECONNAISSANCE

The bantam in the scout car platoon. (Cav Jour — Mar-Apr 1941)
Panzers across the Meuse. (FA Jour — Apr 1941)
Training artillery intelligence personnel. (FA Jour — Apr 1941)
Tank reconnaissance during the march. (Kras — 23 Sep 1940)
Night raid. (Kras — 9 Dec 1940)
German soldiery. A reconnaissance detachment at Liége. (Mil-Woch — 28 Mar 1941)
Motorized reconnaissance detachment in combat in Flanders. [See "Foreign Military Digests"]
Reconnaissance by "Schnelle Truppen" (Fast Troops). [See "Foreign Military Digests"]

RECRUITS RECRUITING

Recruitment. (Mil-Woch — 7 Feb 1941)
The recruiting of administrative personnel. (Rev Mil — Jan 1941)

REMOUNT SERVICE

The remount service. (Cav Jour — Mar-Apr 1941)

RIVER CROSSINGS

Crossing rivers. (Cav Jour — Jan-Feb 1941)
Ferrying operations. (Cav Jour — Mar-Apr 1941)
Panzers across the Meuse. (FA Jour — Apr 1941)
Learning from the engineers. (FA Jour — May 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
A Panzer division crosses the Meuse. (Inf Jour — May 1941)
An analysis of the crossing of the Meuse River by 2d Division A.E.F. on 10-11 November, 1918. (MC Gaz — Mar 1941)
The German passage of the Danube, 22nd-26th November, 1916. (Roy Eng Jour — Mar 1941)
Current trends in use of engineers in combat. [See page 30]
Building a bridge across the Meuse west of Sedan for the crossing of an armored division. [See "Foreign Military Digests"]

ROUTES COMMUNICATIONS

Line of communication. (Ftg Forc — Feb 1941)

Bridges Bridging

The invisible bridge over the Meuse at St. Mihiel, 1918. (Rev Mil — Feb 1941)
Knock-down metallic bridges. (Rev Mil — Mar 1941)
Armored units on roads to victory. [See page 34]
Building a bridge across the Meuse west of Sedan for the crossing of an armored division. [See "Foreign Military Digests"]

Highways Military Roads

The elements of hill road making. (Roy Eng Jour—Mar 1941)
Armored units on roads to victory. [See page 34]

Railways

Transportation development in the Near East (Turkey). (Panzer — Jan, Feb 1941)
Importance of railroads. (Rev Mil — Mar 1941)
French railroads in war. (Ws & Wr — Jan 1941)

Waterways

Great Lakes ports and waterways. (Mil Eng — Mar-Apr 1941)

RUSSIA (ARMY OF)

Offensive action by reinforced regiment. (Kras — 5 Sep 1940)
Attack action by aviation. (Kras — 28 Sep 1940)
Soviet military discipline and disciplinary penalties. (Kras — 22 Oct 1940)

S

SEA POWER

Meeting to commemorate the centenary of the birth of Admiral Alfred Thayer Mahan, U.S.N. (Jour RUSI — Nov 1940)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
The survival of the British Empire: 1792-1812, 1914-1940. (Nav Inst Proc — Feb 1941)
American sea power — 1941 and beyond. (Nav Inst Proc — Apr 1941)
The naval defense of America. (Harpers — Apr 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)

SIGNAL SERVICE

Battle communications. (A Ord — May-Jun 1941)
Signal communications in the First Cavalry Division. (Cav Jour — Mar-Apr 1941)
Communications within the 4th Cavalry. (Cav Jour — Mar-Apr 1941)
German signal forces. (Kras — 13 Sep 1940)
Observation in combat. (Kras — 18 Sep 1940)
A simple, graphic method of solving a sound-range problem in cases where listening posts are in straight line. (Mil Mitt — Feb 1941)
Telephone communications in the battle of Tannenberg. (Rev Mil — Jan 1941)
German wireless communications in the Battle of Tannenberg. (Rev Mil — Feb 1941)
A few considerations regarding the employment of the permanent means of communication during the battle of Tannenberg. (Rev Mil — Mar 1941)
Infra-red rays and their uses. (Rv Mil Suisse—Feb 1941)
War by radio. (For Aff — Apr 1941)

SINGAPORE

Britain's great bastion in the east: Singapore, stubborn obstacle to Japan's ambitious projects in Southern Asia. (Ill Lon News — 1 Mar 1941)

SKI PATROLS

Snow birds. (Inf Jour — Mar 1941)
15th Infantry Ski-Patrol. (Res Off — Apr 1941)

STEEL

Bethlehem steel. (Fortune — Apr 1941)

SUBMARINES

Modern submarine versus major warship. (Nav Inst Proc — Apr 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc — May 1941)

SUPPLY

Export control. (A Ord — Mar-Apr 1941)
Ordnance service in our new army. (A Ord — Mar-Apr 1941)
Our arms grow strong. (A Ord — May-Jun 1941)
Planned munitions. (A Ord — May-Jun 1941)
Ordnance field service. The army's system of armament maintenance and supply. (A Ord — May-Jun 1941)
Supply of horse cavalry regiment. (Cav Jour — Jan-Feb, Mar-Apr 1941)
Viewpoint of the division quartermaster. (Cav Jour — Mar-Apr 1941)
Wartime procurement of field artillery materiel. (FA Jour — Mar 1941)
Gun procurement. (FA Jour — May 1941)
Parliament and the war. (Ftg Forc — Feb 1941)
Line of communication. (Ftg Forc — Feb 1941)
Money, production, and time. (Inf Jour — May 1941)
Food: Use of potato flour. (Jour RAMC — Mar 1941)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
Land warfare. (Jour USII — Jan 1941)
Oil requirements and distribution. (Mil-Woch — 4 Apr 1941)
Motor replacement parts. (QM Rev — Mar-Apr 1941)
Supply takes to the air. (QM Rev — Mar-Apr 1941)
The supplying of munitions in the artillery regiment. (Rev Mil — Feb 1941)
Japan's southward advance — economic and political. (Annals — May 1941)
Bethlehem steel. (Fortune — Apr 1941)
Canada — War — and the U.S.A. (Nation's Bus — May 1941)
The problem of food shortage in Europe. (Round Table — Dec 1940)
Division in heaven. [See page 10]

SURINAM (NETHERLANDS GUIANA)

The European possessions in the Caribbean area. [See "Book Reviews"]

SURPRISE

German cavalry doctrine. (Cav Jour — Jan-Feb 1941)
Panzers across the Meuse. (FA Jour — Apr 1941)
The war in Libya. (Ftg Forc — Feb 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
The art of surprise. (Jour RUSI — Nov 1940)
Some fundamentals of German military operations. [See page 26]

SWITZERLAND (ARMY OF)

The new Swiss infantry drill regulations. (Mil-Woch — 21 Feb 1941)
The war of encounter. (Rv Mil Suisse — Jan 1941)

T

TACTICS OPERATIONS

Defensive Combat

Antitank defense. (FA Jour — May 1941)
Learning from the engineers. (FA Jour — May 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
Attack has a twin. Its name is defense. (Inf Jour — May 1941)
Land warfare. (Jour USII — Jan 1941)
Bringing the shock group of a division into combat during defensive action. (Kras — 25 Oct 1940)
Island defense. (MC Gaz — Mar 1941)
Small change from Dunkirk. (Roy Eng Jour — Mar 1941)
Lessons from World War II. [See page 19]

Offensive Combat

Independent air action. (Aero — 31 Jan 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
Tanks: Arras to Dunkirk. (Inf Jour — Mar 1941)
Air assault on cities. (Inf Jour — Apr 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
Attack has a twin. Its name is defense. (Inf Jour — May 1941)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
Land warfare. (Jour USII — Jan 1941)
Offensive action by reinforced regiment. (Kras — 5 Sep 1940)
The offensive in the mountains. (Kras — 15 Oct 1940)
Assault of a fortified position. (Mil Eng — Mar-Apr 1941)
The war of encounter. (Rv Mil Suisse — Jan 1941)
Division in heaven. [See page 10]
Lessons from World War II. [See page 19]
Some fundamentals of German military operations. [See page 26]
Current trends in use of engineers in combat. [See page 30]
Breakthrough of the German 63d Infantry across the Somme, 5-6 June 1940. [See page 46]
Cooperation between aviation and artillery in the penetration of a defensive zone. [See "Foreign Military Digests"]
German tactics in their aerial attacks on London. [See "Foreign Military Digests"]
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]
Technical considerations for the engineers regarding the employment of the army construction troops in an advance. [See "Foreign Military Digests"]
Meeting engagements of tanks in the strategical depth of the enemy. [See "Foreign Military Digests"]

Special Warfare

Snow birds. (Inf Jour — Mar 1941)
Some lessons of the last war. (Jour RUSI — Feb 1941)
The offensive in the mountains. (Kras — 15 Oct 1940)
Mountain artillery in forest combat. (Kras — 15 Dec 1940)
Expeditionary forces in the desert. (Rev Mil — Feb 1941)
Tactical employment of tanks under winter conditions. [See "Foreign Military Digests"]
The tank company in forest combat. [See "Foreign Military Digests"]

TANKS

Mechanization on the march. (A Ord — Mar-Apr 1941)
Mass production of combat tanks. (A Ord — Mar-Apr 1941)
The armored force. (A Ord — May-Jun 1941)
The armored force. (Cav Jour — Jan-Feb 1941)
Observations of a British Staff Officer. (Cav Jour — Jan-Feb 1941)
Tank action in France. (Cav Jour — Jan-Feb 1941)
The Armored Force School. (Cav Jour — Mar-Apr 1941)
Sub-caliber devices at Fort Knox. (Cav Jour — Mar-Apr 1941)
The Second Armored Division grows up. (Cav Jour — Mar-Apr 1941)
The motorcycle in march control. (Cav Jour — Mar-Apr 1941)
Tanks. (Cav Jour [GB] — Jan 1941)
Field artillery organization, armored force. (FA Jour — Mar 1941)
The artillery in large armored units. (FA Jour — Mar 1941)
Some thoughts on emplacement of antitank guns. (FA Jour — Mar 1941)
Panzers across the Meuse. (FA Jour — Apr 1941)
Molotov cocktail. (FA Jour — Apr 1941)
Antitank defense. (FA Jour — May 1941)
The war in Libya. (Ftg Forc — Feb 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
Tanks: Arras to Dunkirk. (Inf Jour — Mar-Apr 1941)
The new mobility. (Inf Jour — Apr 1941)
From the Chief's Office: Antitank-gun company. (Inf Jour — Apr 1941)
A Panzer division crosses the Meuse. (Inf Jour — May 1941)
Cambrai, 1917. The tanks at Flesquières on the 20th November. (Jour R Art — Jan 1941)
Army and Air Force co-operation. (Jour RUSI — Nov 1940)
Land warfare. (Jour USII — Jan 1941)
Tank reconnaissance during the march. (Kras — 23 Sep 1940)
The offensive in the mountains. (Kras — 15 Oct 1940)
Tanks in pursuit. (Kras — 18 Oct 1940)
The artillery of antitank defense. (Kras — 12 Nov 1940)
Tank action in the zone of approach. (Kras — 29 Nov 1940)
Prophet of the Blitzkrieg. (Nav Inst Proc — May 1941)
Driving tanks on roads. (Panzer — Jan 1941)
The war of encounter. (Rv Mil Suisse — Jan 1941)
Mark I tank experiences in France. (Tank — Feb 1941)
Some fundamentals of German military operations. [See page 26]
Armored units on roads to victory. [See page 34]
Tanks against Warsaw. [See "Foreign Military Digests"]
The march and meeting engagement of motorized infantry. [See "Foreign Military Digests"]
A day of action. [See "Foreign Military Digests"]
Motorized reconnaissance detachment in combat in Flanders. [See "Foreign Military Digests"]
Tactical employment of tanks under winter conditions. [See "Foreign Military Digests"]
The tank company in forest combat. [See "Foreign Military Digests"]
Meeting engagements of tanks in the strategical depth of the enemy. [See "Foreign Military Digests"]

TERRITORY OF CURACAO

The European possessions in the Caribbean area. [See "Book Reviews"]

TOPOGRAPHY SURVEYING

Maps Mapping

An eighteenth century Spanish military camp in Panama. (FA Jour — May 1941)

TRAFFIC CONTROL

Traffic control for administrative marches. (Cav Jour — Jan-Feb 1941)

TRANSPORTATION

Mechanization on the march. (A Ord — Mar-Apr 1941)
Line of communication. (Ftg Forc — Feb 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
Air-landing divisions. (Inf Jour — Apr 1941)
Look aloft! (Inf Jour — Apr 1941)
Land warfare. (Jour USII — Jan 1941)
Mechanical prime-movers for artillery. (Kras — 26 Oct 1940)
Airplane ambulance evacuation. (Mil Surg — Mar 1941)
Transportation development in the Near East (Turkey). (Panzer — Jan, Feb 1941)
German motor transport troops in Iraq. (Panzer — Mar 1941)
Motor transport and the national defense. (QM Rev — Mar-Apr 1941)
The Quartermaster Problem. Use of government transportation requests. (QM Rev — Mar-Apr 1941)

Advantages of motorized medical units in the transportation and treatment of the wounded in war. (Rev Mil — Dec 1940)
French railroads in war. (Ws & Wr — Jan 1941)
Division in heaven. [See page 10]
The motorized division. [See page 24]
Function of parachutists. [See "Foreign Military Digests"]

TRINIDAD and TOBAGO

The European possessions in the Caribbean area. [See "Book Reviews"]

TROOP MOVEMENTS

Division in heaven. [See page 10]
Function of parachutists. [See "Foreign Military Digests"]

TURKEY

Transportation development in the Near East (Turkey). (Panzer — Jan 1941)

U

UMPIRES

Preparation and execution of tactical exercises of the squad, platoon and company. [See "Foreign Military Digests"]

UNITED STATES (ARMY OF)

Command and Staff

Streamlining the efficiency report. (CA Jour — Mar-Apr 1941)
Administrative and training phases of leadership. [See page 5]

Forts and Military Establishments

The Ordnance Training Center. (A Ord — May-Jun 1941)
Cavalry replacement center. (Cav Jour — Mar-Apr 1941)
Dry land coast artillery. (CA Jour — Mar-Apr 1941)
The Camp Roberts replacement center. (FA Jour — Mar 1941)
They start to roll. (FA Jour — May 1941)
Training a selectee to be an engineer soldier. (Mil Eng — Mar-Apr 1941)
Fort Leonard Wood, Missouri. (Mil Eng — Mar-Apr 1941)
A soldiers' city rises from the dust. (QM Rev — Mar-Apr 1941)
Action in Atlanta! (QM Rev — Mar-Apr 1941)
Camps for 1,418,000. (Fortune — May 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)
National defense: Strategy. (Time — 12 May 1941)

History

There was a war on. (Inf Jour — Mar 1941)

Mobilization

Money, production, and time. (Inf Jour — May 1941)

Organization and Equipment

Ordnance service in our new army. (A Ord — Mar-Apr 1941)
The armored force. (A Ord — May-Jun 1941)
General headquarters. (Cav Jour — Mar-Apr 1941)
Our organization for defense. (Inf Jour — Mar 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
Snow birds. (Inf Jour — Mar 1941)
Training a selectee to be an engineer soldier. (Mil Eng — Mar-Apr 1941)
New Engineer units. (Mil Eng — Mar-Apr 1941)
The cavalry. (Life — 21 Apr 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)
National defense: Strategy. (Time — 12 May 1941)

Schools

The Armored Force School. (Cav Jour — Mar-Apr 1941)

Training

The Ordnance Training Center. (A Ord — May-Jun 1941)
The Armored Force School. (Cav Jour — Mar-Apr 1941)
The ability to learn. (Inf Jour — Mar 1941)
National defense: A program of studies. (Jour Amer Mil Inst —Winter 1940)
A critique of Reserve training. (MC Gaz — Mar 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)
Administrative and training phases of leadership. [See page 5]
Current trends in use of engineers in combat. [See page 30]

Uniforms Insignia

American military dress in the War of 1812. III. Regular infantry. (Jour Amer Mil Inst — Fall 1940)

War Department

General headquarters. (Cav Jour — Mar-Apr 1941)
Leader or adviser? (Cav Jour — Mar-Apr 1941)
The public relations officer. (CA Jour — Mar-Apr 1941)
Replacements. Life-blood of a fighting army. (Inf Jour — May 1941)
The Public Relations Bureau. (Res Off — May 1941)
Army developments in preparedness. (Proc Pol Sci — May 1941)

UNITED STATES (NAVY OF)

Auxiliary Naval Forces

And now — naval R.O.T.C. students become ensigns of the line. (Nav Inst Proc — Apr 1941)

Organization and Equipment

Our organization for defense. (Inf Jour — Mar 1941)
Future cruisers. (Nav Inst Proc — Feb 1941)
American sea power — 1941 and beyond. (Nav Inst Proc — Apr 1941)
Modern submarine versus major warship. (Nav Inst Proc — Apr 1941)
U.S. naval strategy. (Fortune — Jun 1941)
The naval defense of America. (Harpers — Apr 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)
The motorized division. [See page 24]

Personnel

Meeting to commemorate the centenary of the birth of Admiral Alfred Thayer Mahan, U.S.N. (Jour RUSI — Nov 1940)

Training

Down Mobile. (CA Jour — Mar-Apr 1941)
American sea power — 1941 and beyond. (Nav Inst Proc — Apr 1941)
Motion pictures in naval training — an overlooked essential. (Nav Inst Proc — Apr 1941)
U.S. naval strategy. (Fortune — Jun 1941)
The naval defense of America. (Harpers — Apr 1941)
Defense in two oceans. (Proc Pol Sci — May 1941)

V

VENEZUELA

The European possessions in the Caribbean area. [See "Book Reviews"]

VETERINARY SERVICE

Medical service in First Cavalry Division. (Cav Jour — Mar-Apr 1941)

W

WAR PEACE

Export control. (A Ord — Mar-Apr 1941)
Parliament and the war. (Ftg Forc — Feb 1941)
There was a war on. (Inf Jour — Mar 1941)
Our organization for defense. (Inf Jour — Mar 1941)
Soldier and civilian in total war. (Inf Jour — Apr 1941)
Spenser Wilkinson and the defense of Britain. (Jour Amer Mil Inst — Fall 1940)
Canada — War — and the U.S.A. (Nation's Bus — May 1941)

WARS

ASIA

JAPAN-CHINA (1930-)

Review of warfare in China. (Kras — 16 Nov 1940)
In greater East Asia. (Fortune — Apr 1941)

EUROPE

HUNDRED YEARS WAR (1338-1463)

The English soldier in the Campaign of Agincourt. (Jour Amer Mil Inst — Winter 1940)

16th CENTURY

The English at the siege of Rouen in 1591-2. (Roy Eng Jour — Mar 1941)

WARS OF THE FRENCH REVOLUTION (1789-1795)

The Corps of the White Cockade. (Jour RUSI — Feb 1941)

NAPOLEONIC WARS (1795-1815)

Napoleon's counter blockade. (Jour RUSI — Nov 1940)

CRIMEAN WAR (1853-1856)

The Baltic as a theatre of war. The campaign of 1854. (Jour RUSI — Feb 1941)
Southern Bessarabia in 1856. (Roy Eng Jour — Mar 1941)

SOUTH AMERICA

Cavalry in the Rio de la Plata Wars. (Rev Mil — Jan 1941)

UNITED STATES

WAR OF 1812 (1812-1814)

American military dress in the War of 1812. III. Regular infantry. (Jour Amer Mil Inst — Fall 1940)
Military punishments in the War of 1812. (Jour Amer Mil Inst — Winter 1940)

CIVIL WAR (1861-1864)

Down Mobile. (CA Jour — Mar-Apr 1941)
Hilton Head and Port Royal, 1861. (MC Gaz — Mar 1941)
Blockaders off the American coast. (Nav Inst Proc — Feb 1941)

WORLD WAR I (1914-1918)

B — Special Topics

A clearer voice for democracy. (Inf Jour — Mar 1941)

C — Socio-Economic History

War casualties, 1917-1918. (A Med Bul — Jan 1941)

E — General Military History Commanders

The Austrian plan against Russia, 1914. (A Quar — Apr 1941)

G — Arms and Services

ENGINEERS

The German passage of the Danube, 22nd-26th November, 1916. (Roy Eng Jour — Mar 1941)

INFANTRY

Single-handed. (Inf Jour — Mar 1941)
An analysis of the crossing of the Meuse River by 2d Division A.E.F. on 10-11 November, 1918. (MC Gaz — Mar 1941)

SIGNAL

Telephone communications in the battle of Tannenberg. (Rev Mil — Jan 1941)
German wireless communications in the battle of Tannenberg. (Rev Mil — Feb 1941)
A few considerations regarding the employment of the permanent means of communication during the battle of Tannenberg. (Rev Mil — Mar 1941)

H — Military Conduct of the War in the Field

The Warsaw Campaign, October, 1914. (A Quar — Apr 1941)
General Wetzell's plan for 1914. (A Quar — Apr 1941)
The Austrian plan against Russia, 1914. (A Quar — Apr 1941)
Gun procurement. (FA Jour — May 1941)
Single-handed. (Inf Jour — Mar 1941)
Cambrai, 1917. The tanks at Flesquières on the 20th November. (Jour R Art — Jan 1941)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
Some lessons of the last war. (Jour RUSI — Feb 1941)
An analysis of the crossing of the Meuse River by 2d Division A.E.F. on 10-11 November, 1918. (MC Gaz — Mar 1941)
The German passage of the Danube, 22nd-26th November, 1916. (Roy Eng Jour — Mar 1941)
German strategy: 1914 and 1940. (For Aff — Apr 1941)
Palestine, 1918 — France and Belgium, 1940. [See "Foreign Military Digests"]

J — Campaign and Battles

ASIATIC AREA — TURKISH THEATER

Mesopotamian Front

German motor transport troops in Iraq. (Panzer — Mar 1941)

Palestine Front

Palestine, 1918 — France and Belgium, 1940. (Jour RUSI — Nov 1940) [See also, "Foreign Military Digests"]

EUROPEAN AREA — BALKAN THEATER

Rumanian Front

The German passage of the Danube, 22nd-26th November, 1916. (Roy Eng Jour — Mar 1941)

EUROPEAN AREA — RUSSIAN THEATER

The Warsaw Campaign, October, 1914. (A Quar — Apr 1941)
The Austrian plan against Russia, 1914. (A Quar — Apr 1941)
Telephone communications in the battle of Tannenberg. (Rev Mil — Jan 1941)
German wireless communications in the Battle of Tannenberg. (Rev Mil — Feb 1941)
A few considerations regarding the employment of the permanent means of communication during the battle of Tannenberg. (Rev Mil — Mar 1941)

EUROPEAN AREA — WESTERN THEATER

1914

General Wetzell's plan for 1914. (A Quar — Apr 1941)
Escape from encirclement. (Kras — 13 Dec 1940)

1917

Cambrai, 1917. The tanks at Flesquières on the 20th November. (Jour R Art — Jan 1941)

1918

Single-handed. (Inf Jour — Mar 1941)
An analysis of the crossing of the Meuse River by 2d Division A.E.F. on 10-11 November, 1918. (MC Gaz — Mar 1941)
The invisible bridge over the Meuse at St. Mihiel, 1918. (Rev Mil — Feb 1941)

L — Naval History

Who sunk the Hampshire? (MC Gaz — Mar 1941)
The death of a fleet. (Nav Inst Proc — Mar 1941)

WORLD WAR — UNITED STATES

There was a war on. (Inf Jour — Mar 1941)
Replacements. Life-blood of a fighting army. (Inf Jour — May 1941)
As it was before. (In 1917-1918) (MC Gaz — Mar 1941)
High commanders of the A.E.F.: Walter Henry Gordon. (Rec News — Mar 1941)
High commanders of the A.E.F.: Joseph Ernst Kuhn. (Rec News — Apr 1941)
High commanders of the A.E.F.: William Weigel. (Rec News — May 1941)

WORLD WAR II (1939-)

Independent air action. (Aero — 31 Jan 1941)
Try it out. (Aero — 31 Jan 1941)
The war in the air. (Aero — 21 Feb 1941)

Surprises in the Mediterranean. (Aero — 21 Feb 1941)
The growing night offensive. (Aero — 7 Mar 1941)
The war at sea. December, 1940-February, 1941. (A Quar — Apr 1941)
The R.A.F. in the first half of the second year of war. (A Quar — Apr 1941)
Observations of a British Staff Officer. (Cav Jour — Jan-Feb 1941)
Combats by German cavalry regiments in the east and west. (Cav Jour — Jan-Feb 1941)
Tank action in France. (Cav Jour — Jan-Feb 1941)
The fifth quarter of the War. (Cav Jour [GB] — Jan 1941)
Strategem in the north. (FA Jour — Mar 1941)
The artillery in large armored units. (FA Jour — Mar 1941)
Panzers across the Meuse. (FA Jour — Apr 1941)
British artillery in Flanders. (FA Jour — Apr 1941)
Artillery in action on the Aisne on June 9. (FA Jour — May 1941)
Adventure at Jussey. (FA Jour — May 1941)
The war in Libya. (Ftg Forc — Feb 1941)
Parliament and the war. (Ftg Forc — Feb 1941)
Notes on the war in the air. (Ftg Forc — Feb 1941)
The German war machine. (Ftg Forc — Feb 1941)
The Navy in 1940. (Ftg Forc — Feb 1941)
The army in 1940. (Ftg Forc — Feb 1941)
The Air War, 1940. (Ftg Forc — Feb 1941)
More light on Dunkirk. (Ftg Forc — Apr 1941)
Notes on the war in the air. (Ftg Forc — Apr 1941)
Naval estimates. (Ftg Forc — Apr 1941)
Army estimates. (Ftg Forc — Apr 1941)
Air estimates. (Ftg Forc — Apr 1941)
Salonika again. (Ftg Forc — Apr 1941)
Tanks: Arras to Dunkirk. (Inf Jour — Mar, Apr 1941)
What happened at Sedan. (Inf Jour — Apr 1941)
Money, production, and time. (Inf Jour — May 1941)
A Panzer division crosses the Meuse. (Inf Jour — May 1941)
The first year of the War, 1939-40. (Jour RUSI — Nov 1940)
Palestine, 1918 — France and Belgium, 1940. (Jour RUSI — Nov 1940)
"How have the lessons of the War of 1914-1918 been confirmed or modified by the experiences of the present war up to date?" (Jour RUSI — Feb 1941)
The influence of air forces on the course of the war. (Jour RUSI — Feb 1941)
Diary of the War, 1940-41. (Jour RUSI — Feb 1941)
Land warfare. (Jour USII — Jan 1941)
An interlude in the Campaign in Norway. (Jour USII — Jan 1941)
Italian operations in the Alps. (Kras — 6 Oct 1940)
Certain conclusions from air force action in the west. (Kras — 22 Oct 1940)
Attack aviation abroad. (Kras — 29 Nov 1940)
The infantry regiment in attack on the Maginot Line. (Kras — 3 Dec 1940)
Night raid. (Kras — 9 Dec 1940)
Mountain artillery in forest combat. (Kras — 15 Dec 1940)
The advance of a German infantry regiment on Dunkirk. (Kras — 17 Dec 1940)
Sea warfare today. (Mil Mitt — Jan 1941)
Contemporary defense sketches: Dakar. (Mil Mitt — Feb 1941)
England's preparedness potentiality at the outbreak of war in 1939. (Mil Mitt — Mar 1941)
Monographs of the War on the Western Front. (Mil Rund — Jan 1941)
The Blitzkrieg in France. (Mil-Woch — 28 Feb 1941)
German soldiery. Our company attacks Calais. (Mil-Woch — 7 Mar 1941)
German soldiery. A reconnaissance detachment at Liége. (Mil-Woch — 28 Mar 1941)
A Finnish army corps commander describes the Finnish-Russian War. (Mil-Woch — 4 Apr 1941)
Engineers in battle. (Mil Eng — Mar-Apr 1941)
Studies of the Polish campaign. (Rv Mil Suisse — Jan 1941)
Small change from Dunkirk. (Roy Eng Jour — Mar 1941)
Eclipse of a division. (Roy Eng Jour — Mar 1941)
Heroes of the "Fast Troops." [See "Foreign Military Digests"]
Mark I tank experiences in France. (Tank — Feb 1941)
The campaign in Greece. (Tank — Feb 1941)
The Middle Eastern command. (Tank — Feb 1941)
French railroads in war. (Ws & Wr — Jan 1941)
Lessons from the War on the Polish side. (Ws & Wr — Feb 1941)
German strategy: 1914 and 1940. (For Aff — Apr 1941)
War by radio. (For Aff — Apr 1941)
How America can take the offensive. (Fortune — May 1941)
The Sicilian Straits: The vital channel in the Mediterranean War. (Ill Lon News — 28 Jan 1941)
The "Stukas" return. (Ill Lon News — 28 Jan 1941)
"Position" land-mining a road surface for depth-charge. (Ill Lon News — 22 Feb 1941)
The war with Nazi Germany. (Ill Lon News — 22 Feb 1941)
Saving the Luftwaffe. (Ill Lon News — 22 Feb 1941)
The war with Nazi Germany: The Far East. (Ill Lon News — 1 Mar 1941)
War in the Balkans. (Life — 21 Apr 1941)
Canada — War — and the U.S.A. (Nation's Bus — May 1941)
The strategy of the war. (Round Table — Dec 1940, Mar 1941)
The Home Guard. (Round Table — Dec 1940)
Ireland in the vortex. (Round Table — Dec 1940)
Great Britain. (Round Table — Dec 1940)
Australia. (Round Table — Dec 1940)
New Zealand. (Round Table — Dec 1940)
Lessons from World War II. [See page 19]
Armored units on roads to victory. [See page 34]
Breakthrough of the German 63d Infantry across the Somme, 5-6 June 1940. [See page 46]
Dakar. [See "Foreign Military Digests"]
German tactics in their aerial attacks on London. [See "Foreign Military Digests"]
Tanks against Warsaw. [See "Foreign Military Digests"]
Motorized detachment in Holland. [See "Foreign Military Digests"]
Battleship or aircraft carrier. [See "Foreign Military Digests"]
A day of action. [See "Foreign Military Digests"]
Motorized reconnaissance detachment in combat in Flanders. [See "Foreign Military Digests"]
Tactical employment of tanks under winter conditions. [See "Foreign Military Digests"]
Palestine, 1918 — France and Belgium, 1940. [See "Foreign Military Digests"]
Building a bridge across the Meuse west of Sedan for the crossing of an armored division. [See "Foreign Military Digests"]
The battle for Arras. [See "Foreign Military Digests"]

WEAPONS

The Johnson light machine gun. (A Ord — May-Jun 1941)
Sub-caliber devices at Fort Knox. (Cav Jour — Mar-Apr 1941)
A tracer control trainer. (CA Jour — Mar-Apr 1941)
Field artillery organization, armored force. (FA Jour — Mar 1941)
The artillery in large armored units. (FA Jour — Mar 1941)
Some thoughts on emplacement of antitank guns. (FA Jour — Mar 1941)
Wartime procurement of field artillery materiel. (FA Jour — Mar 1941)
Molotov cocktail. (FA Jour — Apr 1941)
Rise and fall of the American "75." (FA Jour — Apr 1941)
Antitank defense. (FA Jour — May 1941)
Gun procurement. (FA Jour — May 1941)
Traditionalism and military defeat. (Inf Jour — Mar 1941)
From the Chief's Office: Antitank-gun company. (Inf Jour — Apr 1941)
Attack has a twin. Its name is defense. (Inf Jour — May 1941)
Some lessons of the last war. (Jour RUSI — Feb 1941)
The artillery of antitank defense. (Kras — 12 Nov 1940)
Assault of a fortified position. (Mil Eng — Mar-Apr 1941)
Big Bertha, 1855 style. (Nav Inst Proc — Feb 1941)
The survival of the British Empire: 1792-1812, 1914-1940. (Nav Inst Proc — Feb 1941)
Prophet of the Blitzkrieg. (Nav Inst Proc — May 1941)
Let's try a new weapon. (Nav Inst Proc — May 1941)
Concerning the trajectory of bombs. (Rev Mil — Feb 1941)
The use of mine-throwers in the precipitation of avalanches. (Rv Mil Suisse — Feb 1941)
Some fundamentals of German military operations. [See page 26]
Power-dive bombers. [See "Foreign Military Digests"]

WINDWARD ISLANDS OF GREAT BRITAIN

The European possessions in the Caribbean area. [See "Book Reviews"]

WITHDRAWAL

Small change from Dunkirk. (Roy Eng Jour — Mar 1941)

One often speaks of the usefulness and necessity of strong reserves. That dogma is closely connected with the theory of progressive consumption of forces: it is held to be a sacred dogma. Thus one often sees, on maneuvers, large infantry masses attacking though deploying only a small number of rifles. The whole of the remainder follows in close order, with drums beating, and hurrahs, as if such means would drive the enemy away. All reserves are dead forces . . . Reserves are only useful under the condition that they should come into action . . . On may even imagine a case where one might conveniently abstain from setting up a reserve; such would be the case if one exactly knew the strength of the enemy and if the latter had already completely deployed.

von der Goltz; quoted in Foch, *The Principles of War.*

New Reading Courses for Officers

(Reprinted for the information of the service.)

TRAINING CIRCULAR
No. 25

WAR DEPARTMENT,
WASHINGTON, *April 5, 1941.*

Reading courses for officers. — Bulletin No. 44, War Department, 1928; and Bulletin No. 46, War Department, 1931, as amended by Bulletin No. 6, War Department, 1938, and Section I, Bulletin No. 1, Bulletin No. 4, and Section I, Bulletin No. 19, War Department, 1939, are rescinded and the following substituted therefor:

1. *General reading course.* — *a.* In order to make available to officers who do not have access to extensive libraries information as to literature of especial value in their military education, the following bibliography of selected literature relating to philosophical, psychological, historical, political, economic, and military subjects is published for the information of the service.

b. This list has been selected from among many works with a view to providing a properly diversified course of reading, and is intended to serve the purposes of an outline to give form to the general scope of an officer's reading. It is not intended to serve the purposes of an exhaustive bibliography, and officers pursuing especial lines of investigation and study will find it necessary to consult many other meritorious works not included in the list.

c. The classification used and the order in which the books are listed, in general, are those of the Library of Congress classification system. It is advisable for officers to read at least six works from this list every year in addition to the reading of books and periodicals of current interest, the selections from this list to be from more than one classification in order properly to diversify the reading.

LIST OF BOOKS

(1) *Philosophy and psychology.*

The Story of Philosophy. (Durant, Will.)
Social Psychology. (Katz, Daniel, and Schank, R. L.)
Propaganda. (Doob, Leonard William.)
The Art of Leadership. (Tead, Ordway.)
Aptitude and Aptitude Testing. (Bingham, Walter Van Dyke.)
Industrial Psychology. (Viteles, Morris Simon.)
Technics and Civilization. (Mumford, L.)
American Politics. (Odegarde, Peter, and Helms, E. A.)
Making of the Modern Mind. (Randall, John Herman.)

(2) *History.* — (*a*) *General.*

Outline of History. 2 vols. (Wells, H. G.)
Decisive Battles. (Fuller, John F. C.)
The Influence of Sea Power upon History, 1660-1783. (Mahan, Alfred Thayer.)
International Politics. (Schuman, F. L.)
The Middle Ages. (Munro, Dana Carleton.)
Great Captains. Gustavus Adolphus. (Dodge, Theodore A.)
Great Captains. Alexander. 2 vols. (Dodge, Theodore A.)
A Greater Than Napoleon. Scipio Africanus. (Hart, B. H. Liddell.)
Great Captains. Hannibal. 2 vols. (Dodge, Theodore A.)
Great Captains. Caesar. 2 vols. (Dodge, Theodore A.)

(*b*) *World War (1914-18).*

The World Crisis. 4 vols. (Churchill, Winston.)
The History of the Great War. 4 vols. (Buchan, John.)
A Brief History of the Great War. (Hayes, Carlton J.H.)
Out of My Life. (Hindenburg, Marshal von.)
Ludendorff's Own Story. 2 vols. (Ludendorff, General Erich.)
The General Staff and Its Problems. 2 vols. (Ludendorff, General Erich.)
German Strategy in the Great War. (Neame, Lt. Col. Philip.)
The March on Paris, 1914. (Von Kluck, General Alexander.)
Soldiers and Statesmen, 1914-1918. 2 vols. (Robertson, Sir Wm. Robert.)
Tannenberg, the First Thirty Days in East Prussia. (Ironside, Sir Edmund.)
American Siberian Adventures. (Graves, Wm. Sidney.)
Five Years in Turkey. (Von Sanders, Gen. Liman.)
My Campaign in Mesopotamia. (Townshend, Maj. Gen. Sir Charles V.F.)
The Dardanelles. (Caldwell, C. E.)
My Experiences in the World War. 2 vols. (Pershing, John J.)
The American Army in France. (Harbord, James Guthrie.)
The American Army in the European Conflict. (De Chambrun, Col., and De Marenches, Capt.)
The Enemy Within. (Landau, Capt. Henry.)
The Rhineland Occupation. (Allen, Henry T.)

(*c*) *Great Britain.*

Wellington. (Guedalla, Philip.)
Life of Lord Kitchener. 3 vols. (Arthur, Sir George.)
From Private to Field Marshal. (Robertson, Field Marshal Sir William.)
Allenby. (Wavell, Sir Archibald Percival.)
Twenty-Five Years, 1892-1916. 2 vols. (Grey of Falladon, Viscount Edward.)

(*d*) *France.*

The Great Captains. Napoleon. 4 vols. (Dodge, Theodore A.)
Fournier's Napoleon the First. 2 vols. (Fournier, August [translation by Adams, Annie Elizabeth].)
Napoleon as a General. 2 vols. (Von Wartenburg, Count Yorck.)
The Memoirs of Marshal Foch. (Foch, Marshal.)

(*e*) *Germany.*

Revolution of Nihilism. (Rauschnigg, H.)

(*f*) *Union of Soviet Socialist Republics.*

The History of Russia. (Pares, Bernard.)
The Land of the Soviets. (Mikhailov, Nicholas.)

(*g*) *Asia.*

Inside Asia. (Gunther, John.)
Nanshan and Port Arthur. (Tretyakov, N. A.)
The Philippines, Past and Present. 2 vols. (Worcester, Dean C.)
The Far East. (Treat, Payson I.)

(*h*) *America; United States.*

The Discovery of America. 2 vols. (Fiske, John.)
The Rise of American Civilization. 2 vols. (Beard, Charles A. and Mary R.)
America in Midpassage. Vol. 3. (Beard, Charles A. and Mary R.)
History of American Frontier, 1763-1893. (Paxson, Frederic L.)
History of the United States Army. (Ganoe, William Addleman.)
American Campaigns. Vol. 1, Text; Vol. 2, Maps. (Steele, Matthew Forney.)
Military Policy of the United States. (Upton, Emory.)
The United States Army in War and Peace. (Spaulding, Oliver L.)
Diplomatically Speaking. (Griscom, Lloyd C.)
A History of the United States Navy. (Knox, Dudley W.)
Race Relations. (Weatherford, Willis Duke.)
George Washington. 2 vols. (Lodge, Henry Cabot.)
The American Revolution. 2 vols. (Fiske, John.)
Life of John Marshall. 4 vols. (Beveridge, Albert S.)
Benjamin Franklin, the First Civilized American. (Russell, Phillips.)
The Critical Period of American History. 2 vols. (Fiske, John.)
The Life of Andrew Jackson. (Bassett, John Spencer.)
The War With Mexico. 2 vols. (Smith, Justin H.)
Personal Memoirs of U. S. Grant. 2 vols. (Grant, U. S.)
Stonewall Jackson and the American Civil War. 2 vols. (Henderson, G. F. R.)
Memoirs of General W. T. Sherman. 2 vols. (Sherman, William Tecumseh.)
Abraham Lincoln. The War Years. 4 vols. (Sandburg, Carl.)
R. E. Lee. 4 vols. (Freeman, Douglas Southall.)
The Virginia Campaign, 1864-65. (Humphreys, Andrew A.)
The Story of the Civil War. 4 vols. (Ropes, John Codman, and Livermore, William Roscoe.)
Statesmen and Soldiers of the Civil War. (Maurice, Maj. Gen. Sir Frederick.)
Military Memoirs of a Confederate. (Alexander, E. P.)
Grover Cleveland, the Man and the Statesman. (McElory, Robert.)

(*i*) *Latin America.*

Historic Evolution of Hispanic America. (Rippy, James Fred.)
The Caribbean. (Roberts, W. Adolphe.)
History of the Latin American Nations. (Robertson, William Spence.)
South America. (Jones, Clarence F.)

(3) *Economics.*

Modern Economy in Action. (Ware, C., and Means, G.)
Principles of Economics. (Taussig, Frank William.)
North America. (Smith, J. Russell.)
Industrial America in the World War. (Clarkson, Grosvenor B.)
Strategy of Raw Materials. (Emeny, Brooks.)
America's Capacity to Produce. (Nourse, Edwin G.)

(4) *Political science.*

A History of Political Theory. (Sabine, G. H.)
Union Now. (Streit, Clarence K.)
March of Fascism. (Raushenbush, Steven.)
Dictatorships in the Modern World. (Ford, Guy Stanton.)
American Government and Politics. (Beard, Charles A.)
The American Commonwealth. 2 vols. (Bryce, James.)
Introduction to American Government. (Ogg, Frederic A., and Ray P. Orman.)
The Politics of Democracy. (Herring, Edward Pendleton.)

(5) *International relations.*

Our Future in Asia. (Smith, Robert Aura.)
Isolated America. (Buell, Raymond Leslie.)
United States in World Affairs. (Council on Foreign Relations.)
Foreign Policy in the Making. (Friedrich, Carl Joachim.)
A History of American Foreign Policy. (Latane, John Holladay.)
The Monroe Doctrine and Interpretation. (Hart, Albert Bushnell.)
Latin America and the United States. (Stuart, Graham H.)

(6) *Military science.*

Pen and Sword in Greece and Rome. (Spaulding, Oliver L.)
The War of the Future. (Von Bernhardi, Gen. Friedrich A. J.)
On War. (Clausewitz, Gen. Carl von.)
The Principles of War. (Foch, Gen. Ferdinand.)
The Conduct of War. (Von der Goltz, Colmar F.)
The Nation in Arms. (Von der Goltz, Colmar F.)
Art of Modern War. (Foertsch, Hermann.)
Roots of Strategy. (Phillips, Thomas R.)
Battle Studies. (du Picq, Col. Ardant.)
Maneuver in War. (Willoughby, Charles Andrew.)
The Ramparts We Watch. (Eliot, George Fielding.)
The War of Secret Service. (Rowan, R. W.)
Rise of Rail Power in War and Conquest, 1833-1914. (Pratt, E. A.)
Bombs Bursting in Air. (Eliot, George Fielding.)
Air Power and Armies. (Slessor, J. C.)

2. *Reserve officers' reading course.*—The following list of books is furnished from which the necessary number of books to be read are selected by Reserve officers to meet the requirements of AR 140-20 to 140-30, inclusive:

LIST OF BOOKS

a. Adjutant General's Department Reserve (AR 140-22).

Employment Psychology. (Burtt.)
Who Are These Americans? (Sears.)
Psychology for Executives. (Smith.)
Born That Way. (O'Connor.)
Aptitudes and Aptitude Testing. (Bingham.)
Men, Women and Jobs. (Paterson and Darley.)
The Science of Work. (Viteles.)
Occupational Counselling Techniques. (Supt. of Documents, 1939.)
How to Interview. (Bingham and Moore.)
The Personnel System of the U. S. Army. (Supt. of Documents, 1919.)
The Officers Guide. (The Military Service Publishing Company.)
Infantry in Battle. (The Infantry Journal, Inc.)
Warfare. (Spaulding, Nickerson, Wright.)
Roots of Strategy. (Phillips.)

b. Air Corps Reserve (AR 140-23).

Officers Manual. (Moss.)
Air Navigation. (Weems.)
Air Warfare. (Sherman.)
The Principles of War. (Foch.)
War On Great Cities. (Ross.)
War Over England. (Charlton.)
War From the Air. (Charlton.)
Air Warfare. (Douhet.)
Zeppelin. (Lehmann.)
Air Defense. (Ashmore.)
Air Power and Armies. (Slessor.)
Our Future in the Air. (Groves.)
Behind the Smoke Screen. (Groves.)
The War in the Air. (Raleigh and Jones.)
Beginnings of Organized Air Power. (Spaight.)
This Flying Game. (Arnold and Baker.)
German Air Force in the Great War. (Neumann.)
Flyign. (Fechet.)
German Air Raids on Great Britain. (Morris.)
Zeppelins Over England. (von Buttlar.)
Air Weapon. (Gamble.)

c. Chaplain's Reserve (AR 140-25).

Psychology and God. (Grensted.)
Youth in a Believing World. (Archer.)
The Story of Religion in America. (Sweet).
The Religious Background of American Culture. (Hall.)
The Criminal. (Geisert.)
Health for Mind and Spirit. (Northridge.)
After Its Kind. (Nelson.)
Military History of the World War. (McEntee.)
The Bulwark of the Republic. (Hendricks.)
The Military Policy of the United States. (Upton.)
History of the United States Army. (Ganoe.)
Principles of War. (Foch.)
The Fifteen Decisive Battles of the World. (Creasy.)
The Study of War for Statesmen and Citizens. (Aston.)
The Federalist. (Lodge.)
Psychology For Religious Workers. (Dewar and Hudson.)
Souls in the Making. (Mackenzie.)
Diagnosing Personality and Conduct. (Symonds.)
The Religion of a Healthy Mind. (Holman.)
The Unity of Philosophical Experience. (Gilson.)
The Art of Ministering to the Sick. (Cabot and Dicks.)

d. Chemical Warfare Service Reserve (AR 140-26). — (1) *Books pertaining to Chemical warfare.*

Chemical Warfare. (Fries and West.)
World War Casualties from Gas and Other Weapons. (Gilchrist.)
History of the First Gas Regiment. (Addison.)
Medical Aspects of Chemical Warfare. (Vedder.)
Der Chemische Krieg. (Hanslian.)
Chemicals in War. (Prentiss.)
Gas, The Story of the Special Brigade. (Foulkes.)
Die Chemische Waffe. (Muller.)

(2) *United States military history.*

Military Policy of the United States.[1] (Upton.)
American Campaigns. (Steele.)
United States Army in Peace and War. (Spaulding.)
American Revolution. (Trevelyan.)
First Year of the American Revolution. (French.)
Washington, Commander-in-Chief. (Frothingham.)
Sea Power and its Relation to the War of 1812. (Mahan.)
War with Mexico. (Smith.)
Bird's-eye View of the Civil War. (Dodge.)
Generalship of U. S. Grant. (Fuller.)
R. E. Lee. 4 vols. (Freeman.)
Stonewall Jackson and the American Civil War. (Henderson.)
Martial Spirit. (Millis.)
My Experiences in the World War (Pershing.)
American Army in France. (Harbord.)
American Army in the European Conflict. (de Chambrun and de Marenches.)

(3) *General military history.*

The Fifteen Decisive Battles of the World. (Creasy.)
World Crisis 4 vols. (Churchill.)
With Napoleon in Russia. (de Coulaincourt.)
Influence of Sea Power on History. (Mahan.)
Military History of the World War. (McEntee.)

(4) *General military profession.*

Cavalry Combat. (Cavalry School.)
Infantry Battalion in War. (Wheeler.)
Infantry in Battle. (Infantry School.)
Principles of War. (Foch.)
Principles of Strategy. (Naylor.)
Operations of War. (Hamley.)
War of the Future. (von Bernhardi.)

(5) *Industrial mobilization.*

The Giant Hand. (Crowell and Wilson.)
The Armies of Industry. (Crowell and Wilson.)
American Industry in the War. (Baruch.)
Ordnance and the World War. (Crozier.)
Report of the Chief of Staff, U. S. Army, 1919.
Readings on the Economics of War. (Clark.)
Principles of Industrial Organization. (Kimball.)
Industrial Management. (Lansburg.)
The Administration of Industrial Enterprise. (Jones.)
Report of the War Trade Board, 1917-1919.
Government Control over Prices. (Garrett.)
Journal of the Great War. (Dawes.)
America's Munitions, 1917-1918 — Report of Benedict Crowell. (War Department.)
The Strategy of Raw Materials. (Emeny.)
Industrial Mobilization Plan, 1936. (War Department.)
The Development of American Industries. (Glover and Cornell.)
Munitions Industry, Final Report of the Chairman of the War Industries Board.
Management Handbook. (Alford.)

(6) *Scientific.*

Industrial Carbon. (Mantell.)
Applied Colloid Chemistry. (Bancroft.)
Smoke, A Study of Aerial Disperse Systems. (Gray and Patterson.)
Meteorology. (Milham.)
Physical Chemistry for Colleges. (Millard.)
Industrial Chemistry. (Riegel.)
Industrial Poisons in the United States. (Hamilton.)
Lethal War Gases. (Underhill.)
Noxious Gases. (Henderson and Haggard.)
Military Explosives. (Weaver.)
Air Conditioning. (Moyer.)
Technical Writing. (Rickard.)

e. Corps of Engineers Reserve (AR 140-28). — (1) *Professional.*

Field Service Regulations, FM 100-5, 100-10, and 100-15.
Staff Officers' Field Manual, FM 101-5 and 101-10.
Engineer Field Manuals, FM 5-5, 5-10, 5-15, 5-20, 5-25, and 5-30.
The ROTC Manual — Engineers — Advanced.
The Military Police of the United States. (Upton.)
History of the United States Army. (Ganoe.)
American Campaigns. 2 vols. (Steele.)
Principles of War. (Foch.)
Historical Report of the Chief of Engineers, A. E. F. (W. D. Doc. No. 907.)
The Art of Modern Warfare. (Foertsch.)
20th Century Warfare. (Limpus.)
Infantry Battalion in War. (Wheeler.)
Infantry in Battle. (Infantry School.)
Cavalry Combat. (Cavalry School.)
Maneuver in War. (Willoughby.)
Dynamics of War and Revolution. (Dennis.)
Current year issues of:
C. & G. S. S. Military Review (Quarterly).
Military Engineer.
Infantry Journal.
Other service journals.

(2) *Military history in general.*

Napoleon. (Ludwig.)
The Fifteen Decisive Battles of the World. (Creasy.) (Latest edition with Battle of Marne included.)
Great Captains. (Dodge.)
The Study of War for Statesmen and Citizens. (Aston.)
Inevitable War. (Stockton.)

(3) *Early American history.*

The Dutch and Quaker Colonies in America. (Fiske.)
The Federalist. (Lodge.)
Benjamin Franklin. (Fay.)
The Influence of Sea Power on History, 1660-1782. (Mahan.)
The Critical Period of American History, 1783-1789. (Fiske.)
History of the American Frontier, 1763-1893. (Paxton.)
The Conspiracy of Pontiac. (Parkman.)

(4) *Civil War history.*

A Bird's Eye View of the Civil War. (Dodge.)
Robert E. Lee, the Soldier. (Maurice.)
Statesmen and Soldiers of the Civil War. (Maurice.)
Military Memoirs of a Confederate. (Alexander.)
The Story of the Civil War. 4 vols. (Ropes and Livermore.)
The Generalship of U. S. Grant. (Fuller.)

(5) *World War history.*

A Guide to Military History of the World War. (Frothingham.)
My Experiences in the World War. (Pershing.)
Soldiers and Statesmen, 1914-1918. (Robertson.)
Ludendorff's Own Story, August, 1914-November, 1918. (von Ludendorff.)
A History of the Great War. 4 vols. (Buchan.)
Transporting the A. E. F. in Western Europe, 1917-1919. (Wilgus.)
Any authoritative work covering the subject, and approved by the Chief of Engineers.

f. Finance Department Reserve (AR 140-30).

Principles of Economics, 1939. 2 vols. (Taussig.)
Business and Capitalism, 1939. (Gras.)
Outline of Economics, 6th Edition, 1937. (Ely.)
Accounting Principles and Practices, 1940. (Hatfield, Sanders, and Burton.)
Money and Banking, 1936. (Fosters and Rodgers.)
Business Statistics, 1932. (Riggleman and Frisbee.)
Economic Recovery of Germany, 1939. (Guillebaud.)
Currency and Credit, 1930. (Hawtrey.)
Textbook of Law and Business, 1938. (Spencer.)
Methods and Procedures in Federal Purchasing, 1933. (Monteith and Burack.)
Industrial Purchasing, 1933. (Lewis.)
Budgeting, 1934. (Sinclair.)
Personnel Problems, 1931. (Baridon and Loomis.)
The Art of Leadership, 1935. (Tead.)
Industrial America, 1936. (Pound.)
Economic Geography, 1935. (Whitebeck and Finch.)
Economic and Social Geography, 1933. (Huntington, Williams, and Van Valkenburg.)
History of Economic Thought, 1936. (Henry.)
America Self Contained, 1933. (Crowther.)
Financial Organization and Management of Business, 1939. (Gerstenberg.)
Reserve Banks and the Money Marker, 1936. (Burgess.)
Latin American Problems, 1932. (Lee.)
Greater America, 1932. (Thompson.)
The Outline of History. (Wells.)
Elements of United States History. (Channing.)
The History of American Foreign Policy. (Latane.)
The Military Policy of the United States. (Upton.)

g. Military Intelligence Reserve (References not required) (AR 140-34). — (1) *United States.*

(*a*) *Prerevolutionary period.*

The Discovery of America. (Fiske.)
The Beginnings of New England. (Fiske.)
Old Virginia and Her Neighbors. (Fiske.)
The Dutch and Quaker Colonies in America. (Fiske.)
New France and New England. (Fiske.)
The Old Regime in Canada. (Parkman.)

(*b*) *Revolutionary period.*

The American Revolution. (Fiske.)
George Washington. (Lodge.)
The Federalist. (Lodge.)
Life and Times of Benjamin Franklin. (Parton.)

(*c*) *After 1789.*

The American Commonwealth. (Bryce.)
The Military Policy of the United States. (Upton.)
The Rise of American Civilization. (Beard.)
Robert E. Lee. (Freeman.)
The Monroe Doctrine. (Hart.)
America's Foreign Relations. (Johnson.)
Stonewall Jackson and the American Civil War. (Henderson.)
American Campaigns. (Steele.)
Life of John Marshall. (Beveridge.)
Memoirs of General William T Sherman.
The War with Mexico. (Smith.)
Personal Memoirs of General U. S. Grant.
The Philippines, Past and Present. (Worcester.)
The Age of Big Business, Vol. 39. (Hendrick.)
Roosevelt and the Caribbean. (Hill.)
My Experiences in the World War. (Pershing.)

(2) *British Empire.*

A Short History of the English People. (Green.)
History of Civilization in England. (Buckle.)
History of England. (Macauley.)
The Canadian Dominion. (Skelton.)
The English Constitution. (Bagehot.)
How Britain is Governed. (Muir.)
Empire Government. (Nathan.)
Geography of the British Empire. (Bunting and Collen.)
Imperial Military Geography. (Cole.)
British Military History, 1660-1936. (Cole and Priestly.)
Elements of Imperial Defense. (Boycott.)
Military Organization and Administration. (Lindsell.)
Wellington. (Guedalla.)
The War Office. (Gordon.)

(3) *France.*

Joffre's Memoirs.
History of France. (Kitchen.)
The French Revolution. (Madelin.)
A Study in Nationality. (Siegfried.)
The Framework of France. (Daniels.)
France, A Regional and Economic Geography. (Ormsby.)
Napoleon. (Dodge.)
The French Political System. (Middleton.)
The Economic Policy of France. (Peel.)
French Indo China. (Thompson.)
The French War Machine. (Davis.)
Battle Studies; Ancient and Modern Battle. (du Picq.)
The Principles of War. (Foch.)
The Influence of Sea Power Upon the French Revolution and Empire, 1793-1812. (Mahan.)
CQG. (De Pierrefeu.)

(4) *Union of Soviet Socialist Republics.*

Civic Training in Soviet Russia. (Harper.)
40,000 Against the Arctic. (Smolka.)
The Government of the Soviet Union. (Harper.)
A History of Russia. (Pares.)
In Stalin's Secret Service. (Krivitsky.)
Land of the Soviets. (Mikhaylov.)
Political and Diplomatic History of Russia. (Vernadsky.)
The Red Army. (Voroshilov, Makhlis, Budyonny, Stern.)
Russia and Asia. (Lobanov-Rostovsky.)
Russia and the Soviet Union in the Far East. (Yakhontoff.)
Russia's Iron Age. (Chamberlin.)
A Short History of the U. S. S. R. (Shestakov.)
Soviet Communism — A New Civilization. (Webb.)
Soviet Planned Economic Order. (Chamberlin.)
Soviet Russia. (Chamberlin.)
The Soviet Union and International Law. (Taracousio.)
The Bolshevik Revolution, 1917-1918. (Bunyan and Fisher.)
Russian Campaign of 1914. (Golovine.)
Russia Under the Soviet Rule. (de Basily.)
Handbook of the Soviet Union, 1936.

(5) *Germany.*

Germany. (Barker.)
Germany and the Germans from an American Point of View. (Collier.)
Mein Kampf. (Hitler.)
The House that Hitler Built. (Roberts.)
Across the Frontiers. (Gibbs.)
A Short History of Germany. (Henderson.)
Tannenberg. (Ironsides.)
Germany since 1740. (Priest.)
Frederick the Great. (Young.)
Bismarck and the Foundation of the German Empire. (Headlam.)
The Nation in Arms. (Von der Goltz.)
On War. (Von Clausewitz.)
Out of My Life. (Von Hindenburg.)
My War Memories, 1914-1918. (Von Ludendorff.)

(6) *Italy.*

The History of the Decline and Fall of the Roman Empire. (Gibbons.)
Caesar. (Dodge.)
Hannibal. (Dodge.)
Cavour. (Paleologue.)
Fascism, Economic Foundations of. (Enzig.)
Italy's International Economic Position. (McGuire.)
Dangerous Sea. (Slocombe.)
Balkan Conferences and Balkan Entente. (Kerner and Howard.)
Air Warfare. (Douhet.)
Anno XIIII — Conquest of an Empire. (De Bono.)

(7) *Japan.*

A Short History of Japan. (Clement.)
What Japan Thinks. (Kawakami.)
The Rise of a Modern Power. (Porter.)
Japan — A Short Cultural History. (Sansome.)
Japan's Foreign Relations — 1542-1936. (Akagi.)
Aliens in the East. (Wildes.)
Fifty Years of American-Japanese Relations. (Dulles.)
Russia and the Soviet Union in the Far East. (Yak ontoff.)
Japan Over Asia. (Chamberlain.)
The Problem of Japan. (Kennedy.)
The Far East in World Politics. (Hudson.)
Eyes on Japan. (Yakhontoff.)
War and Diplomacy in the Japanese Empire. (Takeuchi.)
Militarism and Fascism in Japan. (Tanin and Yohan.)
Militarism in Japan. (Colegrove.)
When Japan Goes to War. (Tanin and Yohan.)
War in the Pacific. (Denlinger and Gary.)
The Military Side of Japanese Life. (Kennedy.)
The Japanese Population Problem. (Crocker.)
Japan's Feet of Clay. (Utley.)
Japanese Trade and Industry, Present and Future. (Mitsubishi Economic Research Bureau.)
The Economic Strength of Japan. (Isoshi Asahi.)
Japan in China. (Bisson.)
Our Future in Asia. (Smith.)

(8) *Latin America.*

The Conquest of Mexico. (Prescott.)
The Mexican Nation. (Priestley.)
The Republics of Latin America. (James and Martin.)
Latin America in World Politics. (Rippy.)
The Hispanic Nations of the New World. (Shepherd.)
The Mexican Mind. (Thompson.)
The History of Latin American Nations. (Robertson.)
Argentina, Brasil, and Chile since Independence. (Wilgus.)
Bolivar. (Lemly.)
Bolivar. (Ybarra.)
Latin America and the War. (Martin.)
Latin America and the United States. (Stuart.)
Geography of Latin America. (Carlson.)
The Isthmian Highway. (Miller.)
The Five Republics of Central America. (Munro.)
The Pageant of Cuba. (Strode.)

(9) *Other countries.* — (*a*) *Czechoslovakia.*

Watch Czechoslovakia. (Freund.)

(*b*) *Hungary.*

The Evolution of Hungary and its Place in History. (Teleki.)

(*c*) *Netherlands.*

Rise of the Dutch Republic. (Hotley.)

(*d*) *Poland.*

Poland. (Patterson.)
Pilsudski. (Humphrey.)
America and the New Poland. (Fisher.)

(*e*) *Rumania.*

The Balkan States. (Oxford Press.)

(*f*) *Finland.*

Finland. (Rothery.)

[1] May be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C.

(g) China.

What's Wrong with China? (Gilbert.)
A Sketch of Chinese History. (Pott.)
The Chinese — Their History and Culture. (Latourette.)
Japan in China. (Bisson.)
Americans in Eastern Asia. (Dennett.)
China — The Collapse of a Civilization. (Peffer.)
Red Star over China. (Snow.)
My Country and My People. (Lin yu-tang.)
The Good Earth. (Pearl Buck.)
Economic Handbook of the Pacific Area. (Field.)

(h) Spain.

Spain in the Nineteenth Century. (Latimer.)
Spain. (de Madariaga.)
The Spanish Cockpit. (Borkenav.)
The March of a Nation. (Cardoso.)

(i) Portugal.

The Portugal of Salazar. (Derrick.)

(j) Belgium.

A Short History of Belgium. (Van der Essen.)
A History of the Flemish Movement. (Clough.)

(k) Turkey.

Five Years in Turkey. (Von Sanders.)
Dardanelles. (Callwell.)

(10) *Miscellaneous.*

The Strategy of Raw Materials. (Emeny.)
The Great Powers and World Politics. (Simonds and Emeny.)
The New World Problems in Political Geography. (Bowman.)
Military Intelligence. (Sweeney.)
Combat Intelligence. (Schwein.)
S-2 In Action. (Thomas.)
Liaison 1914. (Spears.)
Aerial Photography. (Reeves.)
Topography and Strategy in the War. (Johnson.)
Battlefields of the World War. (Johnson.)
Police Interrogation. (Kidd.)
Twenty Years as a Military Attache. (Mott.)
I Found no Peace. (Miller.)
The Webb. (Hough.)
The American Black Chamber. (Yardley.)
Spy and Counter Spy. (Rowan.)
Modern Spies Tell Their Story. (Rowan.)
The "Intelligence" Game of Secret Service Cases and Problems. (Gerrard.)
Secrets of Crewe House. (Stuart.)
Secret Service. (Aston.)
All's Fair. (Landau.)
Secrets of the White Lady. (Landau.)
Revelations of an International Spy. (Lincoln.)
British Agent. (Lockhart.)
My Adventures as a Spy. (Baden-Powell.)
Strange Intelligence, Memoirs of the Naval Secret Service. (Bywater and Farraday.)
Seven Pillars of Wisdom. (Lawrence.)
The German Spy System in France. (Lanoir.)
On Special Missions. (Lucieto.)
In the Enemy's Country. (Crozier.)
I Was a Spy. (McKenna.)
The German Secret Service. (Nicolai.)
Secret Service on the Russian Front. (Wild.)
The Secrets of the German War Office. (Graves.)
Invisible Weapons. (Silber.)
Spies Break Through. (Bauermeistar.)
Espionage in Industry and War. (Ronge.)
Memoirs of a Spy. (Snowden.)
The Story of Industrial Espionage. (Calkins.)
Propaganda and Promotional Activities and Annotated Bibliography. (University of Minnesota Press.)
A Discussion of Human Affairs. (Beard.)
Report of the Chairman of the Committee on Public Information. (U.S. Government Printing Office.)
The Press in War Time. (Cook.)
How We Advertise America, 1920. (Creel.)
Words That Won The War. (Mock and Larson.)
Allied Propaganda and the Collapse of the German Empire in 1918. (Bruntz.)
Lord Riddell's War Diary, 1914-1918.
Falsehood in War Time. (Ponsonby.)
The Army Behind the Army. (Powell.)
Propaganda in the Next War. (Rogerson.)

h. Ordnance Department Reserve (AR 140-36). — (1) *Professional.*

American Coast Artillery Materiel. (Ord. Dept. Doc. No. 2042.)
Army Ordnance Districts, 1918-1919. (Ord. Dept. Doc. No. 2030.)
Chemicals in War. (Prentiss.)
Elements of Ordnance. (Hayes.)
Explosives. (Marshall.)
The Fighting Tank Since 1916. (Jones-Rarey-Icks.)
History of Explosions. (Assheton.)
If War Comes. (DuPuy and Eliot.)
Military Explosives. (Weaver.)
Military Policy of the United States. (Upton.)
Military Pyrotechnics. (Faber.)
Naval Ordnance. (U. S. Naval Institute.)
Navy Ordnance Activities. (Navy Bureau of Ordnance.)
Ordnance and the World War. (Crozier.)
Paris, or the Future of War. (Hart.)
Post War Ordnance. (Hodges.)
Principles of War. (Foch.)
Railway Artillery. (Ord. Dept. Doc. No. 2034.)
The Ramparts We Watch. (Eliot.)
The Service of Supply. (Hagood.)
Supply in Modern War. (Shaw.)
The United States Army in Peace and War. (Spaulding.)
We Can Defend America. (Hagood.)
Technical Writing. (Rickard.)

(2) *Biographical and historical.*

The American Army in France. (Harbord.)
American Campaigns. (Steele.)
American Reinforcement in the World War. (Frothingham.)
Benjamin Franklin. (Fay.)
The Border Captain — Andrew Jackson. (James.)
The Federalist. (Lodge.)
The Fifteen Decisive Battles of the World. (Creasy.)
The Generalship of U. S. Grant. (Fuller.)
Great Captains. (Dodge.)
The Great War. (Belloc.)
A Guide to Military History of the World War. (Frothingham.)
A History of the Great War. (Buchan.)
A Historical Sketch of the Organization, Administration, Materiel, and Tactics of the Artillery, United States Army. (Birkhimer.)
A History of the United States Army. (Ganoe.)
The Influence of Sea Power on History, 1660-1782. (Mahan.)
Journal of the Great War. (Dawes.)
Ludendorff's Own Story, 1914-1918. (von Ludendorff.)
Meet General Grant. (Woodward.)
Napoleon. (Ludwig.)
A New American History. (Woodward.)
R. E. Lee — A Biography. 4 vols. (Freeman.)
Robert E. Lee — The Soldier. (Maurice.)
Through the Fog of War. (Hart.)
The Unknown War. (Churchill.)
The War With Germany. (Ayres.)

(3) *Diplomatic, political, and social.*

America Comes of Age. (Siegfried.)
America's Foreign Relations. (Johnson.)
America Now. (Stearns.)
American Commonwealth. 2 vols. (Bryce.)
American Government and Politics. (Beard.)
The Armies of Labor. (Orth.)
The Canadian Dominion. (Skelton.)
The Epic of America. (Adams.)
The Far Eastern Crisis. (Stimson.)
The History of American Foreign Policy. (Latane.)
Japan Must Fight Britain. (Tota Ishimaru.)
Japan, the Rise of a Modern Power. (Porter.)
The Mexican Nation. (Priestley.)
Militarism in Japan. (Colegrove.)
Modern Democracies. 2 vols. (Bryce.)
The Monroe Doctrine. (Hart.)
The Power to Govern. (Cummings and McFarland.)
The Republics of Latin America. (James and Martin.)
Sea Power on the Pacific. (Bywater.)
Statesmanship or War. (Palmer.)
The Study of War for Statesmen and Citizens. (Aston.)
The United States and Mexico. (Rippy.)

(4) *Finance and economics.*

Business Finance. (Lincoln.)
Forty Years of American Finance. (Noyes.)
Government Control Over Prices. (Garrett.)
Government Contract Law and Administration. (Tanney.)
Report of the President's Committee on Administrative Readings on the Economics of War. (Clark.)
Reserve Banks and the Money Market (1936). (Burgess.)
The System of Financial Administration of Great Britain. (Willoughby.)

(5) *Industrial.*

The Administration of Industrial Enterprises. (Jones.)
American Industry in the War. (Baruch.)
America's Munitions. (Crowell.)
British Industrial Experience During the War. (Hillis.)
Gages, Gaging, and Inspection. (Hamilton.)
History of Manufacturers in the United States. (Clark.)
How America Went to War. (Crowell and Wilson.)
The Giant Hand I.
The Road to France II and III.
The Armies of Industry IV and V.
Industrial America in the World War. (Clarkson.)
Industrial Management. (Lansburg.)
The Industrial Mobilization Plan, 1936. (War Department.)
The Management of Labor Relations. (Watkins.)
Manufacture of Artillery Ammunition. (American Machinist.)
Manufacture of Optical Glass and Optical Systems. (Ord. Dept. Doc. No. 2037.)
Principles of Industrial Organization. (Kimball.)
Production of 75-mm. H. E. Shell. (Ayers.)

i. Quartermaster Corps Reserve (AR 140-37).

History of the United States Army. 1 vol. (Ganoe.)
The Story of the Civil War. 4 vols. (Ropes and Livermore.)
American Campaigns. 2 vols. (Text and Atlas.) (Steele.)
Napoleon's Maxims of War with Notes by General Burnod. 1 vol. (d'Aguilar.)
Battle Studies; Ancient and Modern Battle. 1 vol. (du Picq.)
A History of the Great War. 4 vols. (Buchan.)
The Virginia Campaign of '64 and '65. 1 vol. (Humphreys.)
History of the American Frontier, 1763-1893. 1 vol. (Paxton.)
The War with Mexico. 2 vols. (Smith.)
The Military Policy of the United States. 1 vol. (Upton.)
The Dardanelles. 1 vol. (Callwell.)
Personal Memoirs of U. S. Grant. 2 vols. (Grant.)
The Monroe Doctrine. 1 vol. (Hart.)
The March on Paris and the Battle of the Marne. 1 vol. (von Kluck.)
My Campaign in Mesopotamia. 1 vol. (Townshend.)
The Rise of Rail Power in War and Conquest. 1 vol. (Pratt.)

j. Signal Corps Reserve (AR 140-38).

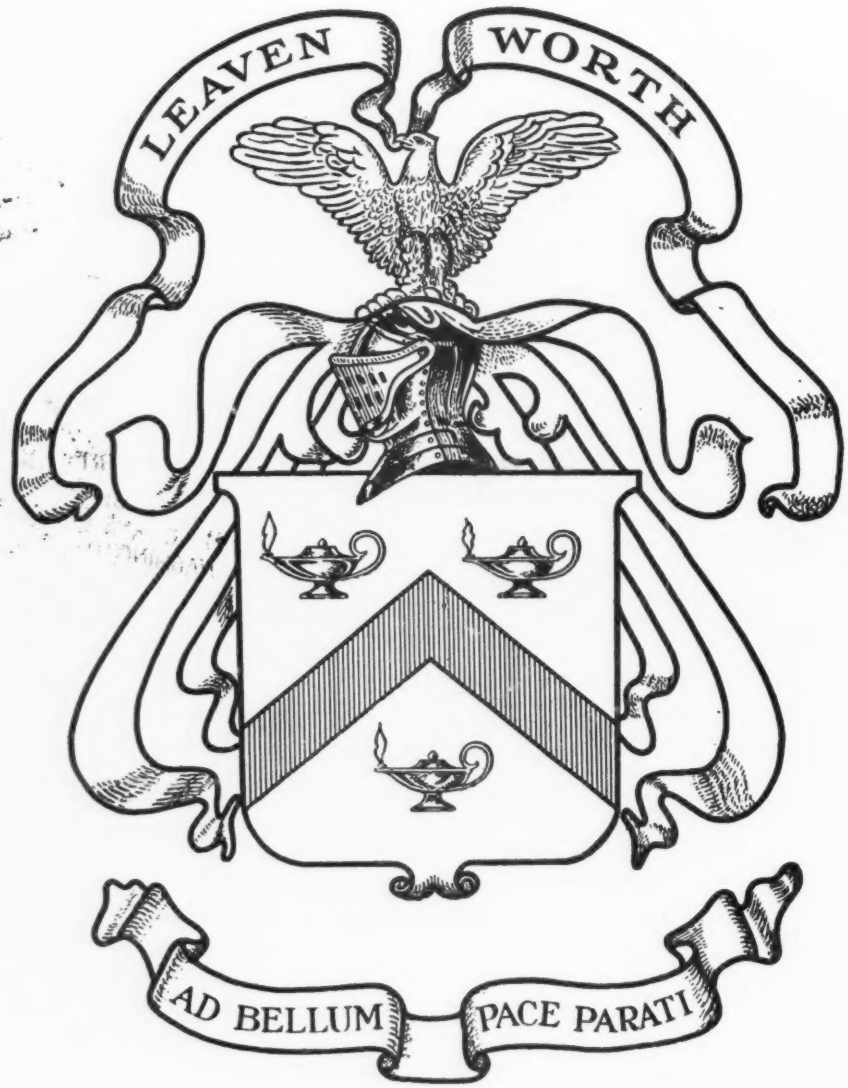
	Lieutenant colonel					Colonel				
	Cryptography	Photography	Pigeons	Supply	Technical	Combat	Cryptography	Photography	Pigeons	Supply	Technical
Air Defense (Ashmore)	x	x	x	x	x						
Field Service Regulations, FM 100-5, 100-10, and 100-15	x	x	x	x	x						
Geography of Latin America (Carlson)	x	x	x	x	x						
History of the United States Army (Ganoe)	x	x	x	x	x						
Japan, The Rise of a Modern Power (Porter)	x	x	x	x	x						
New Directions in the New World (Berle)	x	x	x	x	x						
Report of the Chief Signal Officer (1919)	x	x	x	x	x						
South America (Jones)	x	x	x	x	x						
Staff Officers' Field Manuals, FM 101-5 and 101-10	x	x	x	x	x						
Tannenberg (Ironside)	x	x	x	x	x						
The General Staff and Its Problems (von Ludendorff)	x	x	x	x	x						
The Military Policy of the United States (Upton)	x	x	x	x	x						
The War of the Future in the light of Lessons of the World War (von Bernhardi)	x	x	x	x	x						
War Propaganda and the Radio (Angell)	x										
Alaska (Pilgrim)	x		x	x		x					
Circuits of Victory (Lavine)			x	x				x			
Essays in Pan-Americanism (Lockey)	x	x	x	x	x	x					
Imperial Military Geography (Cole)				x	x	x					
Maneuvers in War (Willoughby)	x	x	x	x	x	x					
Military Intelligence (Sweeney)	x					x					
Movements and Supply of the German First Army during August and September, 1914 (von Kuhl and von Bergman)				x		x				x	
Seven Keys to Brasil (Kelsey)	x	x	x	x	x	x					
Technique of Modern Arms (Mueller)	x	x	x	x	x	x					
The Economics of War (Mendershausen)				x		x					
Trojan Horse in America (Dies)	x	x				x					
The German Secret Service (Nicolai)	x					x	x				
World Minerals and World Politics (Leith)					x		x	x	x	x	x
Air Warfare (Sherman)						x					
American Industry in the War (Baruch)										x	
Caribbean Danger Zone (Rippy)						x	x	x	x	x	x
History of Latin America (Moore)						x	x	x	x	x	x
How America Went to War — Armies of Industry (Crowell and Wilson)										x	x
If War Comes (Dubui)						x					
Industrial Management (Lansburg)										x	x
Latin America — Its Place in World Life (Inman)						x	x	x	x	x	x
Lee (Henderson)						x					
Military Aid to the Civil Power (Command and General Staff School)						x	x			x	
Principles of Strategy (Naylor)						x	x	x	x	x	x
Soldiers and Statesmen, 1914-1918, vol. 1 (Robertson)							x	x	x	x	x
The American Commonwealth (Bryce)						x	x	x	x	x	x
The History of American Foreign Policy (Latane)						x	x	x	x	x	x
The Influence of Sea Power on History, 1660-1782 (Mahan)						x	x	x	x	x	x
The Monroe Doctrine (Hart)						x	x	x	x	x	x
The Ramparts We Watch (Eliot)						x					
Total Defense (Foreman)						x	x	x	x	x	x

[A. G. 350.01 (1-15-41).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,
Chief of Staff.

OFFICIAL:
E. S. ADAMS,
Major General,
The Adjutant General.


LEAVEN WORTH
AD BELLUM PACE PARATI